

## 10/658,272-266144-EIC 1700 SEARCH

STRUCTURE SEARCH

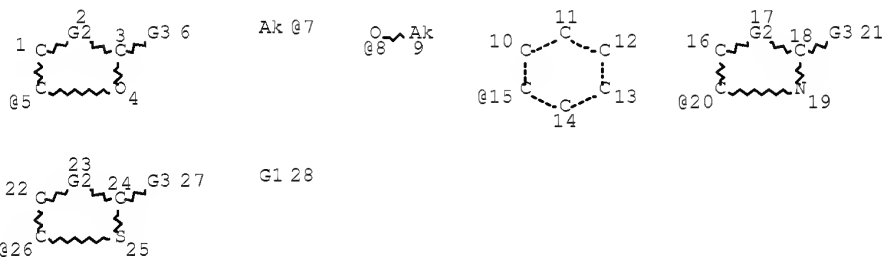
=&gt; d his l132

(FILE 'HCAPLUS' ENTERED AT 12:07:51 ON 25 JUL 2008)

L132 27 S L130 AND L131  
 SAV TEMP L132 WEI272HCP/A

=&gt; d que stat l132

L2 54 SEA FILE=REGISTRY ABB=ON PLU=ON (463-79-6/BI OR  
 10377-51-2/BI OR 105-58-8/BI OR 108-32-7/BI OR  
 108-88-3/BI OR 117-80-6/BI OR 1192-62-7/BI OR 1193-79-9  
 /BI OR 126-33-0/BI OR 127-63-9/BI OR 131651-65-5/BI OR  
 13243-65-7/BI OR 1330-20-7/BI OR 14024-11-4/BI OR  
 14283-07-9/BI OR 162684-16-4/BI OR 16851-82-4/BI OR  
 18424-17-4/BI OR 1889-59-4/BI OR 21324-40-3/BI OR  
 271-89-6/BI OR 27359-10-0/BI OR 28122-14-7/BI OR  
 28452-93-9/BI OR 29935-35-1/BI OR 33454-82-9/BI OR  
 35363-40-7/BI OR 3680-02-2/BI OR 37220-89-6/BI OR  
 39300-70-4/BI OR 4265-27-4/BI OR 4437-85-8/BI OR  
 462-06-6/BI OR 524-42-5/BI OR 5535-43-3/BI OR 5535-48-8  
 /BI OR 56525-42-9/BI OR 616-38-6/BI OR 620-32-6/BI OR  
 623-53-0/BI OR 623-96-1/BI OR 625-86-5/BI OR 67-71-0/BI  
 OR 693-98-1/BI OR 71-43-2/BI OR 7439-93-2/BI OR  
 7447-41-8/BI OR 7474-83-1/BI OR 77-77-0/BI OR 7791-03-9  
 /BI OR 80-05-7/BI OR 90076-65-6/BI OR 95-15-8/BI OR  
 96-49-1/BI)  
 L7 SCR 1838  
 L34 STR



VAR G1=5/20/26

VAR G2=C/N

VAR G3=H/C(O)CH3/7/8/15

NODE ATTRIBUTES:

DEFAULT MLEVEL IS ATOM

DEFAULT ECLEVEL IS LIMITED

ECOUNT IS M1-X6 C AT 7

ECOUNT IS M1-X6 C AT 9

GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED

NUMBER OF NODES IS 28

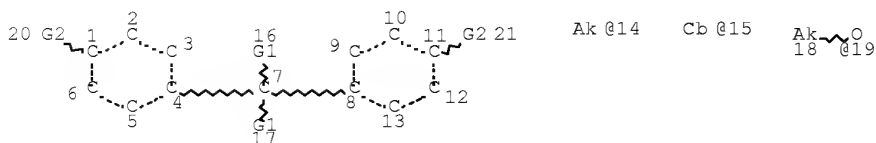
STEREO ATTRIBUTES: NONE

L38 SCR 2043 OR 1840 OR 1918 OR 1947 OR 1994 OR 2016 OR 2026  
 OR 2022 OR 2006

L40 278393 SEA FILE=REGISTRY SSS FUL L34 AND L7 NOT L38

L42 STR

# 10/658,272-266144-EIC 1700 SEARCH



Ak @22

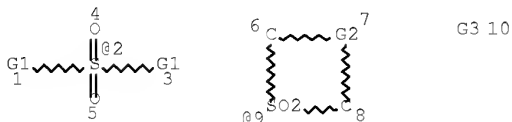
```

VAR G1=14/15
VAR G2=OH/19/22
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
GGCAT IS UNS AT 15
GGCAT IS UNS AT 22
DEFAULT ECLEVEL IS LIMITED
ECOUNT IS M1-X6 C AT 14
ECOUNT IS M6-X12 C AT 15
ECOUNT IS M1-X6 C AT 18
ECOUNT IS M2-X6 C AT 22

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 22
  
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STEREO ATTRIBUTES: NONE
L44 SCR 1839
L45 SCR 1840 OR 2043 OR 1918
L48 3523 SEA FILE=REGISTRY SSS FUL L42 AND L44 NOT L45
L51 STR
  
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VAR G1=AK/CB
REP G2=(0-9) A
VAR G3=2/9
NODE ATTRIBUTES:
CONNECT IS E1 RC AT 4
CONNECT IS E1 RC AT 5
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 10
  
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STEREO ATTRIBUTES: NONE
L57 SCR 2005 AND 2021
L59 SCR 1840 OR 2043 OR 2023 OR 1947 OR 1993 OR 2016 OR 2026
L61 45053 SEA FILE=REGISTRY SSS FUL L51 AND L57 NOT L59
L63 1 SEA FILE=REGISTRY ABB=ON PLU=ON 80-05-7/RN
L65 1 SEA FILE=REGISTRY ABB=ON PLU=ON L2 AND ?PYRROL?/CNS
L66 1 SEA FILE=REGISTRY ABB=ON PLU=ON 271-89-6/RN
L67 1 SEA FILE=REGISTRY ABB=ON PLU=ON 693-98-1/RN
L68 180074 SEA FILE=HCAPLUS ABB=ON PLU=ON "SECONDARY BATTERIES"+
MAX/CT
  
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## 10/658,272-266144-EIC 1700 SEARCH

L69 85408 SEA FILE=HCAPLUS ABB=ON PLU=ON BATTER?(2A) (SECONDAR?  
 OR LITHIUM)  
 L70 199825 SEA FILE=HCAPLUS ABB=ON PLU=ON L68 OR L69  
 L71 52300 SEA FILE=HCAPLUS ABB=ON PLU=ON LITHIUM(2A) (SALT OR  
 HALIDE OR ELECTROLYTE OR CATION OR ION)  
 L72 QUE ABB=ON PLU=ON ELECTROD?(2A) POSITIVE OR CATHOD?  
 L73 QUE ABB=ON PLU=ON SOLVENT?(2A) (ORGANIC OR NONAQUEOUS  
 OR NON(W) AQUEOUS)  
 L74 90575 SEA FILE=REGISTRY ABB=ON PLU=ON L40 AND 1/NR  
 L76 186965 SEA FILE=REGISTRY ABB=ON PLU=ON L40 AND 2/NR  
 L77 155844 SEA FILE=REGISTRY ABB=ON PLU=ON L76 AND 1-99/N  
 L78 147343 SEA FILE=REGISTRY ABB=ON PLU=ON L76 AND 1-99/O  
 L79 119040 SEA FILE=REGISTRY ABB=ON PLU=ON L77 AND L78  
 L80 63851 SEA FILE=REGISTRY ABB=ON PLU=ON L76 AND 1-99/S  
 L81 37023 SEA FILE=REGISTRY ABB=ON PLU=ON L79 AND L80  
 L82 82017 SEA FILE=REGISTRY ABB=ON PLU=ON L79 NOT L81  
 L83 41097 SEA FILE=REGISTRY ABB=ON PLU=ON L76 NOT (L80 OR L81  
 OR L82)  
 L84 580816 SEA FILE=HCAPLUS ABB=ON PLU=ON L74 OR L80 OR L81 OR  
 L82 OR L83  
 L85 26032 SEA FILE=HCAPLUS ABB=ON PLU=ON L48  
 L86 5406 SEA FILE=HCAPLUS ABB=ON PLU=ON L70 AND (L84 OR L85)  
 L87 628 SEA FILE=HCAPLUS ABB=ON PLU=ON L86 AND L71 AND L73  
 L88 257 SEA FILE=HCAPLUS ABB=ON PLU=ON L87 AND L72  
 L89 15 SEA FILE=REGISTRY ABB=ON PLU=ON L2 AND 1-9/LI  
 L92 1 SEA FILE=REGISTRY ABB=ON PLU=ON 7439-93-2/RN  
 L93 11 SEA FILE=REGISTRY ABB=ON PLU=ON L89 NOT (L92 OR  
 TIS/CI)  
 L95 QUE ABB=ON PLU=ON L93  
 L96 207 SEA FILE=HCAPLUS ABB=ON PLU=ON L88 AND L95  
 L97 QUE ABB=ON PLU=ON L61  
 L98 29 SEA FILE=HCAPLUS ABB=ON PLU=ON L96 AND L97  
 L99 288810 SEA FILE=HCAPLUS ABB=ON PLU=ON PASSIVATION+MAX/CT  
 L101 1 SEA FILE=HCAPLUS ABB=ON PLU=ON L99 AND L88  
 L102 54756 SEA FILE=HCAPLUS ABB=ON PLU=ON PASSIVAT?  
 L103 QUE ABB=ON PLU=ON FILM? OR THINFILM? OR LAYER? OR OV  
 ERLAY? OR OVERLAID? OR LAMIN? OR LAMEL? OR MULTILAYER?  
 OR SHEET? OR LEAF? OR FOIL? OR COAT? OR TOPCOAT? OR OVE  
 RCOAT? OR VENEER? OR SHEATH? OR COVER? OR ENVELOP? OR E  
 NCASE? OR ENWRAP? OR OVERSPREAD? OR ENCAPSUL?  
 L104 18876 SEA FILE=HCAPLUS ABB=ON PLU=ON L102 (3A) L103  
 L105 299911 SEA FILE=HCAPLUS ABB=ON PLU=ON L99 OR L104  
 L106 3 SEA FILE=HCAPLUS ABB=ON PLU=ON L105 AND L88  
 L107 10 SEA FILE=HCAPLUS ABB=ON PLU=ON L105 AND L87  
 L108 10 SEA FILE=HCAPLUS ABB=ON PLU=ON L101 OR L106 OR L107  
 L109 72122 SEA FILE=HCAPLUS ABB=ON PLU=ON L63 OR BISPHENOL A  
 L110 46 SEA FILE=HCAPLUS ABB=ON PLU=ON L65 AND PHENYLSULFONYL  
 (A) PYRROLE  
 L111 2580 SEA FILE=HCAPLUS ABB=ON PLU=ON L66 OR PHENYLSULFONYL(  
 A) PYRROLE  
 L112 14059 SEA FILE=HCAPLUS ABB=ON PLU=ON L67 OR BENZOFURAN  
 L113 16109 SEA FILE=HCAPLUS ABB=ON PLU=ON L63 OR BUTYLBENZOFURAN  
 L114 869 SEA FILE=HCAPLUS ABB=ON PLU=ON L65 OR THIANAPHTHENE  
 L115 15128 SEA FILE=HCAPLUS ABB=ON PLU=ON L67 OR METHYLIMIDAZOLE  
 OR METHYL(W) IMIDAZOLE  
 L116 4607 SEA FILE=HCAPLUS ABB=ON PLU=ON L70 AND L73  
 L117 31 SEA FILE=HCAPLUS ABB=ON PLU=ON L116 AND ((L109 OR  
 L110 OR L111 OR L112 OR L113 OR L114 OR L115))  
 L118 10 SEA FILE=HCAPLUS ABB=ON PLU=ON L117 AND L95  
 L119 11 SEA FILE=HCAPLUS ABB=ON PLU=ON L117 AND L71  
 L120 1 SEA FILE=HCAPLUS ABB=ON PLU=ON L118 AND L105  
 L121 5 SEA FILE=HCAPLUS ABB=ON PLU=ON L117 AND L97  
 L122 0 SEA FILE=HCAPLUS ABB=ON PLU=ON L98 AND L105  
 L123 5 SEA FILE=HCAPLUS ABB=ON PLU=ON L117 AND L97  
 L124 73077 SEA FILE=HCAPLUS ABB=ON PLU=ON L109 OR L113 OR L114  
 L125 24 SEA FILE=HCAPLUS ABB=ON PLU=ON L124 AND L116

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L126 10 SEA FILE=HCAPLUS ABB=ON PLU=ON L125 AND (L71 OR L72  
OR L95 OR L105)

L127 51 SEA FILE=HCAPLUS ABB=ON PLU=ON L98 OR L108 OR (L118  
OR L119 OR L120 OR L121 OR L122 OR L123) OR L126

L128 777304 SEA FILE=HCAPLUS ABB=ON PLU=ON ELECTROCHEM?/SC, SX

L129 48 SEA FILE=HCAPLUS ABB=ON PLU=ON L127 AND L128

L130 33 SEA FILE=HCAPLUS ABB=ON PLU=ON L129 AND L72

L131 QUE ABB=ON PLU=ON PY<2004 OR PRY<2004 OR AY<2004 OR  
MY<2004 OR REVIEW/DT

L132 27 SEA FILE=HCAPLUS ABB=ON PLU=ON L130 AND L131

STRUCTURE SEARCH RESULTS

=&gt; d 1132 1-27 ibib ed abs hitstr hitind

L132 ANSWER 1 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2005:394067 HCAPLUS Full-text  
 DOCUMENT NUMBER: 142:433100  
 TITLE: Lithium battery having  
 effective performance  
 INVENTOR(S): Kim, Kwang-Chun; Kim, Jin-Sung; Song, Min-Ho;  
 Yoon, Jang-Ho; Kwon, Teak-Hyen; Lee, Jin-Uk;  
 Kim, Chang-Seob  
 PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea  
 SOURCE: Eur. Pat. Appl., 14 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

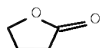
PATENT NO. -----	KIND ----	DATE -----	APPLICATION NO. -----	DATE
EP 1528617	A2	20050504	EP 2004-256676	2004 1028
<--				
EP 1528617	A3	20061004		
EP 1528617	B1	20080709		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, HR				
KR 2005040974	A	20050504	KR 2003-75821	2003 1029
<--				
JP 2005135895	A	20050526	JP 2004-181365	2004 0618
<--				
JP 4012174	B2	20071121		
US 20050095507	A1	20050505	US 2004-938538	2004 0913
<--				
US 7078132	B2	20060718		
CN 1612383	A	20050504	CN 2004-10088037	2004 1029
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PRIORITY APPLN. INFO.:			KR 2003-75821	A 2003 1029
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ED Entered STN: 09 May 2005

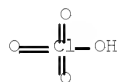
AB A lithium battery has an anode, a cathode having a compound capable of intercalating and deintercalating lithium, a separator interposed between the cathode and the anode, and an electrolyte solution having an electrolyte solute dissolved in a noneq. solvent . The noneq. solvent includes a mixed solvent containing 8 to 15% by volume of ethylene carbonate, 10 to 35% by volume of  $\gamma$ -butyrolactone, 35 to 65% by volume of at least one linear carbonate selected from the group consisting of di-Me carbonate, di-Et carbonate, ethylmethyl carbonate, methylpropyl carbonate, ethylpropyl carbonate and methylbutyl carbonate and 8 to 15% by volume of fluorobenzene, and 0.5 to 9 parts by volume of vinylene carbonate based on 100 parts by volume of the mixed solvent. The noneq. solvent may further include 0.05 to 5 parts by volume of vinyl sulfone, isooxazole or a mixture thereof based on 100 parts by volume of the mixed solvent.

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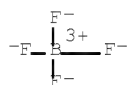
IT 96-48-0,  $\gamma$ -Butyrolactone 7791-03-9,  
 Lithium perchlorate 14283-07-9, Lithium  
 tetrafluoroborate 21324-40-3, Lithium  
 hexafluorophosphate 29935-35-1, Lithium  
 hexafluoroarsenate 33454-82-9, Lithium  
 triflate 90076-65-6 131651-65-5,  
 Lithium nonafluorobutanesulfonate  
 RL: DEV (Device component use); USES (Uses)  
 (lithium battery having effective  
 performance)  
 RN 96-48-0 HCAPLUS  
 CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



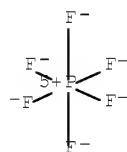
RN 7791-03-9 HCAPLUS  
 CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



RN 14283-07-9 HCAPLUS  
 CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)

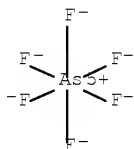


RN 21324-40-3 HCAPLUS  
 CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)

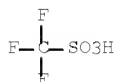


# 10/658,272-266144-EIC 1700 SEARCH

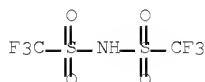
RN 29935-35-1 HCAPLUS  
 CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



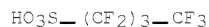
RN 33454-82-9 HCAPLUS  
 CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



RN 90076-65-6 HCAPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



RN 131651-65-5 HCAPLUS  
 CN 1-Butanesulfonic acid, 1,1,1,2,2,3,3,4,4-nonafluoro-, lithium salt (1:1) (CA INDEX NAME)



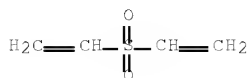
IT 77-77-0, Vinyl sulfone 872-36-6, Vinylene carbonate  
 RL: MOA (Modifier or additive use); USES (Uses)

## 10/658,272-266144-EIC 1700 SEARCH

(lithium battery having effective  
performance)

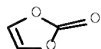
RN 77-77-0 HCAPLUS

CN Ethene, 1,1'-sulfonylbis- (CA INDEX NAME)



RN 872-36-6 HCAPLUS

CN 1,3-Dioxol-2-one (CA INDEX NAME)



IC ICM H01M010-40

CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
Technology)

ST lithium battery effective performance

IT Battery electrolytes

Swelling, physical

(lithium battery having effective  
performance)

IT Carbonaceous materials (technological products)

RL: DEV (Device component use); USES (Uses)

(lithium battery having effective  
performance)

IT Transition metal oxides

RL: DEV (Device component use); USES (Uses)

(lithium-containing; lithium battery  
having effective performance)

IT Secondary batteries

(lithium; lithium battery having  
effective performance)

IT 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene  
carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene  
carbonate 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl  
carbonate 4437-70-1, 2,3-Butylene carbonate 4437-85-8,  
1,2-Butylene carbonate 4437-86-9 4824-75-3, Butyl methyl  
carbonate 7704-34-9, Sulfur, uses 7704-34-9D, Sulfur, compound  
7791-03-9, Lithium perchlorate 12017-96-8,  
Chromium lithium oxide (CrLiO<sub>2</sub>) 12031-65-1, Lithium nickel oxide  
(LiNiO<sub>2</sub>) 12057-17-9, Lithium manganese oxide (LiMn<sub>2</sub>O<sub>4</sub>)  
12162-79-7, Lithium manganese oxide limno<sub>2</sub> 12190-79-3, Cobalt  
lithium oxide (CoLiO<sub>2</sub>) 14283-07-9, Lithium  
tetrafluoroborate 21324-40-3, Lithium  
hexafluorophosphate 29935-35-1, Lithium  
hexafluoroarsenate 33454-82-9, Lithium  
triflate 35363-40-7, Ethyl propyl carbonate, uses 56525-42-9,  
Methyl propyl carbonate, uses 89489-56-5 90076-65-6  
131651-65-5, Lithium nonafluorobutanesulfonate  
RL: DEV (Device component use); USES (Uses)  
(lithium battery having effective  
performance)

IT 77-77-0, Vinyl sulfone 288-14-2, Isoxazole 462-06-6,  
Fluorobenzene 872-36-6, Vinylene carbonate  
RL: MOA (Modifier or additive use); USES (Uses)  
(lithium battery having effective



## 10/658,272-266144-EIC 1700 SEARCH

performance)

L132 ANSWER 2 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2004:857017 HCAPLUS Full-text  
 DOCUMENT NUMBER: 141:352733  
 TITLE: Low temperature electrochemical cells  
 INVENTOR(S): Mikhaylik, Yuriy V.  
 PATENT ASSIGNEE(S): Moltech Corporation, USA  
 SOURCE: U.S. Pat. Appl. Publ., 12 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20040202936	A1	20041014	US 2003-411999	2003 0410
US 7189477	B2	20070313	US 2003-411999	2003 0410

PRIORITY APPLN. INFO.: <--

ED Entered STN: 18 Oct 2004

AB Disclosed is an electrochem. cell comprising a lithium anode and a sulfur-containing cathode and a nonaq. electrolyte solvent. In the fully charged state of the cell the concentration of lithium ions is preferably less than 0.3M. The cell delivers high discharge capacity at discharge rates, for example, C/5, over temps. ranges of from +25° to -20°. Also disclosed is a battery including an electrochem. cell according to the invention and a device that utilizes such a battery to derive power.

IT 77-79-2, 3-Sulfolene 96-47-9, 2-Methyltetrahydrofuran 109-99-9, Thf, uses 126-33-0, Sulfolane 872-93-5, 3-Methylsulfolane 33454-82-9, Lithium triflate 90076-65-6  
 RL: DEV (Device component use); USES (Uses)  
 (low-temperature electrochem. cells)

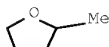
RN 77-79-2 HCAPLUS

CN Thiophene, 2,5-dihydro-, 1,1-dioxide (CA INDEX NAME)



RN 96-47-9 HCAPLUS

CN Furan, tetrahydro-2-methyl- (CA INDEX NAME)



RN 109-99-9 HCAPLUS

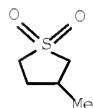
CN Furan, tetrahydro- (CA INDEX NAME)



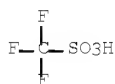
RN 126-33-0 HCAPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



RN 872-93-5 HCAPLUS  
 CN Thiophene, tetrahydro-3-methyl-, 1,1-dioxide (CA INDEX NAME)

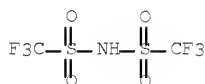


RN 33454-82-9 HCAPLUS  
 CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



● Li

RN 90076-65-6 HCAPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



● Li

IC ICM H01M004-58  
 ICS H01M006-16  
 INCL 429231900; 429231950; 429333000; 429335000; 429338000; 429342000;  
 429331000  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy)

## 10/658,272-266144-EIC 1700 SEARCH

Technology)

Section cross-reference(s): 72

IT Electrochemical cells

Secondary batteries

(low-temperature electrochem. cells)

IT 60-29-7, Diethyl ether, uses 77-79-2, 3-Sulfolene  
 96-47-9, 2-Methyltetrahydrofuran 109-87-5,  
 Dimethoxymethane 109-99-9, Thf, uses 111-43-3,  
 Dipropyl ether 111-96-6, Diethylene glycol dimethyl ether  
 112-49-2, Triethylene glycol dimethyl ether 123-91-1,  
 1,4-Dioxane, uses 126-33-0, Sulfolane 142-68-7,  
 Tetrahydropyran 142-96-1, Dibutyl ether 143-24-8,  
 Tetraethylene glycol dimethyl ether 149-73-5, Trimethoxymethane  
 462-95-3, Diethoxymethane 505-22-6, 1,3-Dioxane 556-65-0,  
 Lithium thiocyanate 646-06-0, 1,3-Dioxolane 872-93-5,  
 3-Methylsulfolane 1634-04-4, Methyl tert-butyl ether  
 7439-93-2, Lithium, uses 7439-93-2D, Lithium,  
 salt 7704-34-9, Sulfur, uses 7704-34-9D, Sulfur,  
 compound 17081-21-9, 1,3-Dimethoxypropane 33454-82-9,  
 Lithium triflate 90076-65-6 111109-77-4, Dipropylene  
 glycol dimethyl ether

RL: DEV (Device component use); USES (Uses)

(low-temperature electrochem. cells)

REFERENCE COUNT: 23 THERE ARE 23 CITED REFERENCES AVAILABLE  
 FOR THIS RECORD. ALL CITATIONS AVAILABLE  
 IN THE RE FORMAT

L132 ANSWER 3 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2004:753254 HCAPLUS Full-text

DOCUMENT NUMBER: 141:228183

TITLE: A nonaqueous electrolyte for  
 lithium secondary  
 battery

INVENTOR(S): Kim, Jin-Hee; Kim, Jin-Sung; Hwang, Sang-Moon;  
 Paik, Meen-Seon; Kim, Hak-Soo

PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea; Cheil  
 Industries Inc.

SOURCE: Eur. Pat. Appl., 33 pp.  
 CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1458048	A1	20040915	EP 2003-90262	2003 0821
<--				
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK				
KR 2004080775	A	20040920	KR 2003-15749	2003 0313
<--				
JP 2005108439	A	20050421	JP 2003-183239	2003 0626
<--				
CN 1531134	A	20040922	CN 2003-155332	2003 0827
<--				
US 20040185347	A1	20040923	US 2003-658272	

## 10/658,272-266144-EIC 1700 SEARCH

2003  
0910

PRIORITY APPLN. INFO.:

<--  
KR 2003-15749

A

2003  
0313

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OTHER SOURCE(S): MARPAT 141:228183

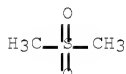
ED Entered STN: 16 Sep 2004

AB An electrolyte for a lithium secondary battery includes lithium salts, a nonaq. organic solvent, and additive compds. The additive compds. added to the electrolyte of the present invention decompose earlier than the organic solvent to form a conductive polymer layer on the surface of a pos. electrode, and prevent decomposition of the organic solvent. Accordingly, the electrolyte inhibits gas generation caused by decomposition of the organic solvent at initial charging, and thus reduces an increase of internal pressure and swelling during high temperature storage, and also improves safety of the battery during overcharge.

IT 67-71-0, Methylsulfone 77-77-0, Vinylsulfone 126-33-0, Tetramethylene sulfone 127-63-8, Phenylsulfone 1839-59-4, Ethylvinylsulfone 3680-02-2, Methylvinylsulfone 5535-43-3, m-ChloroPhenyl vinyl sulfone 5535-48-8, Phenylvinylsulfone 7447-41-8, Lithium chloride (LiCl), uses 7791-03-9, Lithium perchlorate 10377-51-2, Lithium iodide 14024-11-4, Aluminum lithium chloride  $\text{AlLiCl}_4$  14283-07-9, lithium tetrafluoroborate 18424-17-4, lithium hexafluoroantimonate 21324-40-3, Lithium hexafluorophosphate 28122-14-7, p-FluoroPhenyl vinyl sulfone 28452-93-9, Butadiene sulfone 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 90076-65-6 131651-65-5, Lithium nonafluorobutanesulfonate  
 RL: DEV (Device component use); USES (Uses)  
 (nonaq. electrolyte for lithium secondary battery)

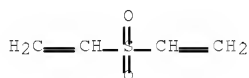
RN 67-71-0 HCAPLUS

CN Methane, 1,1'-sulfonylbis- (CA INDEX NAME)



RN 77-77-0 HCAPLUS

CN Ethene, 1,1'-sulfonylbis- (CA INDEX NAME)

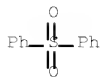


RN 126-33-0 HCAPLUS

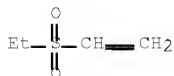
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



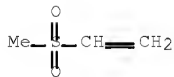
RN 127-63-9 HCAPLUS  
 CN Benzene, 1,1'-sulfonylbis- (CA INDEX NAME)



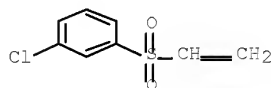
RN 1889-59-4 HCAPLUS  
 CN Ethene, (ethylsulfonyl)- (CA INDEX NAME)



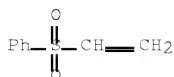
RN 3680-02-2 HCAPLUS  
 CN Ethene, (methylsulfonyl)- (CA INDEX NAME)



RN 5535-43-3 HCAPLUS  
 CN Benzene, 1-chloro-3-(ethenylsulfonyl)- (CA INDEX NAME)



RN 5535-48-8 HCAPLUS  
 CN Benzene, (ethenylsulfonyl)- (CA INDEX NAME)



RN 7447-41-8 HCAPLUS

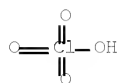
## 10/658,272-266144-EIC 1700 SEARCH

CN Lithium chloride (LiCl) (CA INDEX NAME)



RN 7791-03-9 HCAPLUS

CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



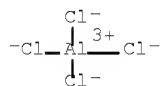
RN 10377-51-2 HCAPLUS

CN Lithium iodide (LiI) (CA INDEX NAME)



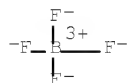
RN 14024-11-4 HCAPLUS

CN Aluminate(1-), tetrachloro-, lithium (1:1), (T-4)- (CA INDEX NAME)



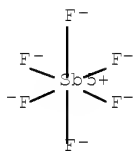
RN 14283-07-9 HCAPLUS

CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)

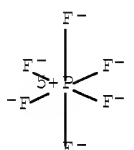


RN 18424-17-4 HCAPLUS

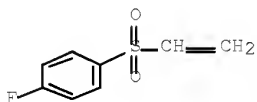
CN Antimonate(1-), hexafluoro-, lithium (1:1), (OC-6-11)- (CA INDEX NAME)



RN 21324-40-3 HCAPLUS  
 CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



RN 28122-14-7 HCAPLUS  
 CN Benzene, 1-(ethenylsulfonyl)-4-fluoro- (CA INDEX NAME)



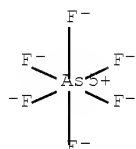
RN 28452-93-9 HCAPLUS  
 CN Thiophene, dihydro-, 1,1-dioxide (CA INDEX NAME)

CM 1

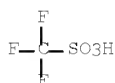
CRN 126-33-0  
 CMF C4 H8 O2 S



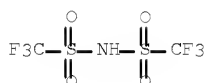
RN 29935-35-1 HCAPLUS  
 CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



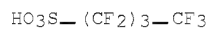
RN 33454-82-9 HCAPLUS  
 CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



RN 90076-65-6 HCAPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



RN 131651-65-5 HCAPLUS  
 CN 1-Butanesulfonic acid, 1,1,1,2,2,3,3,4,4,4-nonafluoro-, lithium salt (1:1) (CA INDEX NAME)



IT 80-05-7, Bisphenol A, uses  
 95-15-8, Thianaphthene 271-89-6, 2,3-Benzofuran 625-86-5, 2,5-Dimethylfuran 693-98-1, 2-Methylimidazole 1192-62-7, 2-Acetylfuran 1193-79-9, 2-Acetyl-5-methylfuran 4265-27-4, 2-Butylbenzofuran 16851-82-4, 1-(Phenylsulfonyl)pyrrole  
 RL: MOA (Modifier or additive use); USES (Uses)

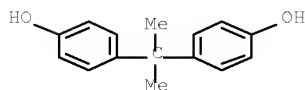


10/658,272-266144-EIC 1700 SEARCH

(nonaq. electrolyte for lithium  
secondary battery)

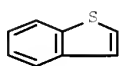
RN 80-05-7 HCAPLUS

CN Phenol, 4,4'-(1-methylethylidene)bis- (CA INDEX NAME)



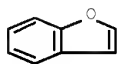
RN 95-15-8 HCAPLUS

CN Benzo[b]thiophene (CA INDEX NAME)



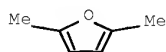
RN 271-89-6 HCAPLUS

CN Benzofuran (CA INDEX NAME)



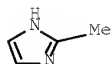
RN 625-86-5 HCAPLUS

CN Furan, 2,5-dimethyl- (CA INDEX NAME)



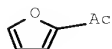
RN 693-98-1 HCAPLUS

CN 1H-Imidazole, 2-methyl- (CA INDEX NAME)

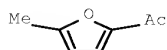


RN 1192-62-7 HCAPLUS

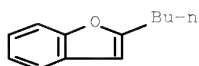
CN Ethanone, 1-(2-furanyl)- (CA INDEX NAME)



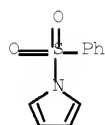
RN 1193-79-9 HCAPLUS  
 CN Ethanone, 1-(5-methyl-2-furanyl)- (CA INDEX NAME)



RN 4265-27-4 HCAPLUS  
 CN Benzofuran, 2-butyl- (CA INDEX NAME)



RN 16851-82-4 HCAPLUS  
 CN 1H-Pyrrole, 1-(phenylsulfonyl)- (CA INDEX NAME)



IC ICM H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST nonaq electrolyte lithium secondary battery; safety nonaq electrolyte lithium secondary battery  
 IT Secondary batteries  
     (lithium; nonaq. electrolyte for lithium secondary battery)  
 IT Battery electrolytes  
     Conducting polymers  
     Safety  
     Swelling, physical  
     (nonaq. electrolyte for lithium secondary battery)  
 IT Aromatic hydrocarbons, uses  
     Esters, uses  
     Ethers, uses  
     Ketones, uses  
     RL: DEV (Device component use); USES (Uses)  
     (nonaq. electrolyte for lithium secondary battery)  
 IT Lithium alloy, base  
     RL: DEV (Device component use); USES (Uses)  
     (nonaq. electrolyte for lithium secondary battery)  
 IT 67-71-0, Methylsulfone 71-43-2, Benzene, uses  
     77-77-0, Vinylsulfone 96-49-1, Ethylene carbonate

## 10/658,272-266144-EIC 1700 SEARCH

105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate  
 108-88-3, Toluene, uses 126-33-0, Tetramethylene sulfone  
 127-63-9, Phenylsulfone 462-06-6, Fluorobenzene  
 463-79-6D, Carbonic acid, chain ester 463-79-6D, Carbonic acid,  
 cyclic ester 463-79-6D, Carbonic acid, ester 616-38-6,  
 Dimethyl carbonate 620-32-6, Benzylsulfone 623-53-0, Methyl  
 ethyl carbonate 623-96-1, Dipropyl carbonate 1330-20-7,  
 Xylene, uses 1889-59-4, Ethylvinylsulfone  
 3680-02-1, Methylvinylsulfone 4437-85-8, Butylene  
 carbonate 5535-43-3, m-ChloroPhenyl vinyl sulfone  
 5535-48-8, Phenylvinylsulfone 7439-93-2, Lithium  
 , uses 7447-41-8, Lithium chloride (LiCl), uses  
 7791-03-9, Lithium perchlorate  
 10277-51-2, Lithium iodide 14024-11-4,  
 Aluminum lithium chloride AlLiCl4 14283-07-9,  
 Lithium tetrafluoroborate 18424-17-4,  
 Lithium hexafluoroantimonate 21324-40-3,  
 Lithium hexafluorophosphate 27359-10-0, Trifluorotoluene  
 28122-14-7, p-FluoroPhenyl vinyl sulfone  
 28452-93-9, Butadiene sulfone 29935-35-1,  
 Lithium hexafluoroarsenate 33454-82-9,  
 Lithium triflate 35363-40-7, Ethyl propyl carbonate,  
 uses 37220-89-6, Aluminum lithium oxide 39300-70-4,  
 Lithium nickel oxide 56525-42-9, Methyl propyl carbonate, uses  
 90076-65-6 131651-65-5, Lithium  
 nonafluorobutanesulfonate 162684-16-4, Lithium manganese nickel  
 oxide

RL: DEV (Device component use); USES (Uses)  
 (nonaq. electrolyte for lithium  
 secondary battery)

IT 80-05-7, Bisphenol A, uses  
 95-15-8, Thianaphthene 117-80-6,  
 2,3-Dichloro-1,4-naphthoquinone 271-89-6, 2,3-  
 Benzofuran 524-42-5, 1,2-Naphthoquinone 625-36-5  
 , 2,5-Dimethylfuran 693-98-1, 2-Methylimidazole  
 1192-62-7, 2-Acetylfuran 1193-79-9,  
 2-Acetyl-5-methylfuran 4265-27-4, 2-  
 Butylbenzofuran 7474-83-1, 3-Bromo-1,2-naphthoquinone  
 13243-65-7, 2,3-Dibromo-1,4-naphthoquinone 16851-82-4,  
 1-(Phenylsulfonyl)pyrrole

RL: MOA (Modifier or additive use); USES (Uses)  
 (nonaq. electrolyte for lithium  
 secondary battery)

REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE  
 FOR THIS RECORD. ALL CITATIONS AVAILABLE  
 IN THE RE FORMAT

L132 ANSWER 4 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2004:493237 HCAPLUS Full-text

DOCUMENT NUMBER: 141:40710

TITLE: Organic electrolyte solution for  
 secondary lithium sulfur  
 battery and the battery using the  
 solution

INVENTOR(S): Kim, Ju-yup; Lee, Suk-su; Yoo, Yoon-kyun; Cho,  
 Myung-dong

PATENT ASSIGNEE(S): Samsung Sdi Co., Ltd., S. Korea

SOURCE: Jpn. Kokai Tokyo Koho, 14 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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## 10/658,272-266144-EIC 1700 SEARCH

JP 2004172126	A	20040617	JP 2003-387193	2003 1117
			<--	
KR 2004043226	A	20040524	KR 2002-71395	2002 1116
			<--	
US 20040157132	A1	20040812	US 2003-694815	2003 1029
			<--	
CN 1501543	A	20040602	CN 2003-10103670	2003 1111
			<--	
PRIORITY APPLN. INFO.:			KR 2002-71395	A 2002 1116
			<--	

ED Entered STN: 18 Jun 2004

AB The electrolyte solution comprises a Li salt and an organic solvent mixture; where the solvent mixture contains a compound of the formula R1(CH2)3R2 [R1 and R2 = halo, OH, (substituted) C1-20 alkyl, (substituted) C1-20 alkoxy, (substituted) C6-30 allyl; (substituted) C6-30 allyl alkyl; (substituted) C6-30 allyloxy, (substituted) C2-30 heteroallyl alkyl, (substituted) C2-30 heteroallyloxy, (substituted) C5-20 cycloalkyl, or (substituted) C5-20 heterocycloalkyl group] or its isomer. The battery has a cathode, containing S or a S compound; an anode; a separator between the cathode and the anode; and the above electrolyte solution

IT 126-33-0, Sulfolane 33454-82-9, lithium trifluoromethanesulfonate 90076-65-6

RL: DEV (Device component use); USES (Uses)  
(organic electrolyte solns. containing dialkoxy propane compds. in solvents for secondary lithium sulfur batteries)

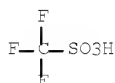
RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



RN 33454-82-9 HCAPLUS

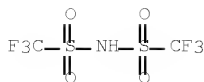
CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



● Li

RN 90076-65-6 HCAPLUS

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



● Li

IC ICM H01M010-40  
ICS H01M004-38; H01M004-58; H01M004-60  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST secondary battery org electrolyte solvent dialkoxy propane compd  
IT Secondary batteries  
(lithium; organic electrolyte solns. containing dialkoxy propane compds. in solvents for secondary lithium sulfur batteries)  
IT Battery electrolytes  
(organic electrolyte solns. containing dialkoxy propane compds. in solvents for secondary lithium sulfur batteries)  
IT 111-96-6, Diethylene glycol dimethyl ether 126-33-0, Sulfolane 646-06-0, Dioxolane 7439-93-2D, Lithium, salts 7704-34-9, Sulfur, uses 9002-88-4, Polyethylene 17081-21-9, 1,3-Dimethoxy propane 33454-82-9, Lithium trifluoromethanesulfonate 90076-65-6  
RL: DEV (Device component use); USES (Uses)  
(organic electrolyte solns. containing dialkoxy propane compds. in solvents for secondary lithium sulfur batteries)

L132 ANSWER 5 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2003:435148 HCAPLUS Full-text

DOCUMENT NUMBER: 138:388239

TITLE: In situ thermal polymerization method for making gel polymer lithium ion rechargeable electrochemical cells

INVENTOR(S): Xing, Weibing; Takeuchi, Esther S.

PATENT ASSIGNEE(S): USA

SOURCE: U.S. Pat. Appl. Publ., 9 pp.

CODEN: USXXCO

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 20030104282	A1	20030605	US 2001-883	2001 1115

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PRIORITY APPLN. INFO.: US 2001-883

2001  
1115

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ED Entered STN: 06 Jun 2003

AB A single step, in situ curing method for making gel polymer lithium ion rechargeable cells and batteries is disclosed. This method used a precursor solution consisting of monomers with multiple functionalities such as multiple acryloyl functionalities, a free-radical generating activator, nonaq. solvents such as ethylene carbonate and

## 10/658,272-266144-EIC 1700 SEARCH

propylene carbonate, and a lithium salt such as LiPF<sub>6</sub>. The electrodes are prepared by slurry-coating a carbonaceous material such as graphite onto an anode current collector and a lithium transition metal oxide such as LiCoO<sub>2</sub> onto a cathode current collector, resp. The electrodes, together with a highly porous separator, are then soaked with the polymer electrolyte precursor solution and sealed in a cell package under vacuum. The whole cell package is heated to in situ cure the polymer electrolyte precursor. The resulting lithium ion rechargeable cells with gelled polymer electrolyte demonstrate excellent electrochem. properties such as high efficiency in material utilization, high Coulombic efficiency, good rate capability, and good cyclability.

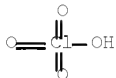
IT 7791-03-9, Lithium perchlorate 14024-11-4,  
Lithium tetrachloroaluminate 14283-07-9, Lithium  
tetrafluoroborate 18424-17-4, Lithium  
hexafluoroantimonate 21324-40-3, Lithium  
hexafluorophosphate 29935-35-1, Lithium  
hexafluoroarsenate 33454-82-9, Lithium triflate  
98076-65-6

RL: DEV (Device component use)

(in-situ thermal polymerization method for making gel polymer  
lithium ion rechargeable electrochem. cells)

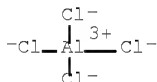
RN 7791-03-9 HCAPLUS

CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



RN 14024-11-4 HCAPLUS

CN Aluminate(1-), tetrachloro-, lithium (1:1), (T-4)- (CA INDEX NAME)



RN 14283-07-9 HCAPLUS

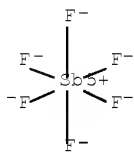
CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



RN 18424-17-4 HCAPLUS

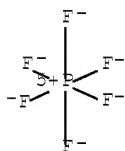
CN Antimonate(1-), hexafluoro-, lithium (1:1), (OC-6-11)- (CA INDEX NAME)

NAME)



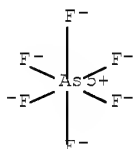
RN 21324-40-3 HCAPLUS

CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



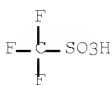
RN 29935-35-1 HCAPLUS

CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)

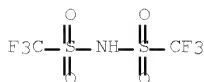


RN 33454-82-9 HCAPLUS

CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



RN 90076-65-6 HCAPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-  
 , lithium salt (1:1) (CA INDEX NAME)



IC ICM H01M010-40  
 ICS H01M004-58; H01M004-66  
 INCL 429303000; 429189000; 429231800; 429245000; 429231100; 029623100  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
 Technology)  
 Section cross-reference(s): 38  
 ST lithium battery gel polymer electrolyte in  
 situ thermal polymn  
 IT Battery electrolytes  
 (in-situ thermal polymerization method for making gel polymer  
 lithium ion rechargeable electrochem. cells)  
 IT Carbon black, uses  
 Coke  
 RL: DEV (Device component use)  
 (in-situ thermal polymerization method for making gel polymer  
 lithium ion rechargeable electrochem. cells)  
 IT Secondary batteries  
 (lithium; in-situ thermal polymerization method  
 for making gel polymer lithium ion  
 rechargeable electrochem. cells)  
 IT Polymerization  
 (thermal; in-situ thermal polymerization method for making gel polymer  
 lithium ion rechargeable electrochem. cells)  
 IT 7429-90-5, Aluminum, uses 7440-02-0, Nickel, uses 7440-06-4,  
 Platinum, uses 7440-25-7, Tantalum, uses 7440-32-6, Titanium,  
 uses 7440-50-8, Copper, uses 7440-57-5, Gold, uses  
 11101-13-6 12597-68-1, Stainless steel, uses  
 RL: DEV (Device component use)  
 (anode current collector; in-situ thermal polymerization method for  
 making gel polymer lithium ion rechargeable  
 electrochem. cells)  
 IT 7440-44-0, Carbon, uses  
 RL: DEV (Device component use)  
 (glassy; in-situ thermal polymerization method for making gel polymer  
 lithium ion rechargeable electrochem. cells)  
 IT 94-36-0, Benzoyl peroxide, processes 105-74-8, Lauroyl peroxide  
 2094-98-6, 1,1'-Azobis(cyclohexanecarbonitrile) 2638-94-0,  
 4,4'-Azobis(4-cyanovaleric acid) 3006-86-8, 1,1-Bis(tert-  
 butylperoxy)cyclohexane 15667-10-4, 1,1-Bis(tert-  
 amylperoxy)cyclohexane  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
 process); PROC (Process)  
 (in-situ thermal polymerization method for making gel polymer  
 lithium ion rechargeable electrochem. cells)  
 IT 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate  
 108-32-7, Propylene carbonate 556-65-0, Lithium thiocyanate  
 685-91-6, n,n-Diethylacetamide 1313-13-9, Manganese dioxide,  
 uses 1313-99-1, Nickel oxide (NiO), uses 1314-62-1, Vanadia,  
 uses 1317-37-9, Iron sulfide (FeS) 1332-37-2, Iron oxide, uses



# 10/658,272-266144-EIC 1700 SEARCH

1344-70-3, Copper oxide 2923-17-3 4437-85-8, Butylene carbonate 7782-42-5, Graphite, uses 7784-01-2, Silver chromate 7789-19-7, Copperfluoride (CuF2) 7791-03-9, Lithium perchlorate 11098-99-0, Molybdenum oxide 11099-11-9, Vanadium oxide 11104-61-3, Cobalt oxide 11105-02-5, Silver vanadium oxide 11113-75-0, Nickel sulfide 11115-76-7, Cobalt selenide 11115-77-8, Cobalt telluride 11115-78-9, Copper sulfide 11115-99-4, Nickel selenide 11116-00-0, Nickel telluride 11118-57-3, Chromium oxide 11126-12-8, Iron sulfide 11129-60-5, Manganese oxide 11130-24-8, Vanadium sulfide 12031-65-1, Lithium nickel oxide (LiNiO2) 12039-13-3, Titanium sulfide (TiS2) 12057-17-9, Lithium manganese oxide (LiMn2O4) 12057-24-8, Lithia, uses 12068-85-8, Iron sulfide (FeS2) 12162-79-7, Lithium manganese oxide (LiMnO2) 12162-92-4, Lithium vanadium oxide (LiV2O5) 12190-79-3, Cobalt lithium oxide (CoLiO2) 12612-50-9, Molybdenum sulfide 12623-97-1, Chromium sulfide 12627-00-8, Niobium oxide 12653-56-4, Cobalt sulfide 12673-92-6, Titanium sulfide 12687-82-0, Manganese sulfide 12789-09-2, Copper vanadium oxide 12795-09-4, Copper telluride 13453-75-3 13463-67-7, Titanium oxide, uses 14024-11-4 , Lithium tetrachloroaluminate 14283-07-9, Lithium tetrafluoroborate 14485-20-2, Lithium tetraphenylborate 15955-98-3, Lithium tetrachlorogallate 18424-17-4, Lithium hexafluoroantimonate 20667-12-3, Silver oxide (Ag2O) 21324-40-3, Lithium hexafluorophosphate 22205-45-4, Copper sulfide (Cu2S) 29835-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 35363-40-7, Ethyl propyl carbonate 37320-90-4, Manganese selenide 37359-15-2, Copper selenide 39290-91-0, Niobium sulfide 39361-71-2, Titanium telluride 50808-87-2, Molybdenum telluride 50814-22-7, Chromium telluride 50926-12-0, Iron selenide 50926-13-1, Iron telluride 51311-17-2, Carbon fluoride 54183-54-9, Molybdenum selenide 54427-25-7, Vanadium telluride 58319-81-6, Manganese telluride 64176-75-6, Niobium selenide 66675-50-1, Titanium selenide 66675-60-3, Chromium selenide 90076-65-6 115028-88-1 131344-56-4, Cobalt lithium nickel oxide 132404-42-3 135751-98-3, Vanadium selenide 162124-03-0, Niobium telluride 181183-66-4, Copper Silver vanadium oxide 188029-35-8, Lithium titanium oxide (Li4-7Ti5O12) 423734-10-5, Cobalt lithium nitride (Co0.1-0.6Li2.4-2.9N) 423734-14-9, Lithium nickel nitride (Li2.4-2.9Ni0.1-0.6N) 527698-30-2, Copper lithium tin oxide (Cu0.92LiSn0.08O2)

RL: DEV (Device component use)

(in-situ thermal polymerization method for making gel polymer lithium ion rechargeable electrochem. cells)

IT 26426-04-0P, Trimethylolpropane trimethacrylate homopolymer 57592-66-2P, Pentaerythritol tetraacrylate homopolymer 57592-67-3P, Hexanediol diacrylate homopolymer 64401-02-1P, Bisphenol A-ethylene oxide adduct diacrylate 67653-78-5P, Dipentaerythritol hexaacrylate homopolymer 82200-28-0P, Dipentaerythritol pentaacrylate homopolymer 85887-85-0P, Ethoxylated trimethylolpropane triacrylate homopolymer 103315-68-0P, Di(trimethylolpropane)tetraacrylate homopolymer 117223-60-6P

RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation)

(in-situ thermal polymerization method for making gel polymer lithium ion rechargeable electrochem. cells)

L132 ANSWER 6 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2002:964691 HCAPLUS Full-text

DOCUMENT NUMBER: 138:42046

TITLE: Secondary lithium battery

INVENTOR(S): Seki, Keiichi; Kobayashi, Mitsuharu; Saito, Hiroyuki; Yamamoto, Masaki

## 10/658,272-266144-EIC 1700 SEARCH

PATENT ASSIGNEE(S): Mitsubishi Chemical Corporation, Japan  
 SOURCE: PCT Int. Appl., 78 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002101869	A1	20021219	WO 2002-JP5656	2002 0607

&lt;--

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA,  
 CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI,  
 GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KR,  
 KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW,  
 MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI,  
 SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU,  
 ZA, ZM, ZW

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT,  
 BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC,  
 NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,  
 ML, MR, NE, SN, TD, TG

AU 2002306285	A1	20021223	AU 2002-306285	2002 0607
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JP 2003086249	A	20030320	JP 2002-166936	2002 0607
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EP 1406338	A1	20040407	EP 2002-733389	2002 0607
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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE,  
 MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR

CN 1799162	A	20060705	CN 2002-811342	2002 0607
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US 20040110068	A1	20040610	US 2003-727661	2003 1205
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PRIORITY APPLN. INFO.:	JP 2001-171851	A	2001 0607
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JP 2001-179748	A	2001 0614
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JP 2001-192635	A	2001 0626
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WO 2002-JP5656	W	2002 0607
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ED Entered STN: 20 Dec 2002

AB The battery has a cathode, an anode, and an electrolyte in a flexible battery case;  
 where the enthalpy difference between the neutral nonaq. electrolyte solvent mol. and

# 10/658,272-266144-EIC 1700 SEARCH

it monovalent anion radical, formed by adding an electron to the mol.,  $\Delta E_{sol}$  is greater than the enthalpy difference between an additive in the battery and it monovalent anion radical, formed by adding an electron to the mol.,  $\Delta E_{add}$ . The additive is preferably a Lewis acid, e.g. a S compound having a S:O bonding.

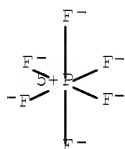
IT 21324-40-3, Lithium hexafluorophosphate

RL: DEV (Device component use); USES (Uses)

(enthalpy difference between neutral mol. and monovalent anion radical of solvent and additive in electrolytes for secondary lithium batteries)

RN 21324-40-3 HCAPLUS

CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



IT 67-71-0, Dimethyl sulfone 126-33-0, Sulfolane

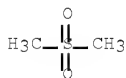
1600-44-8, Tetramethylene sulfoxide

RL: DEV (Device component use); PRP (Properties); USES (Uses)

(enthalpy difference between neutral mol. and monovalent anion radical of solvent and additive in electrolytes for secondary lithium batteries)

RN 67-71-0 HCAPLUS

CN Methane, 1,1'-sulfonylbis- (CA INDEX NAME)



RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



RN 1600-44-8 HCAPLUS

CN Thiophene, tetrahydro-, 1-oxide (CA INDEX NAME)



## 10/658,272-266144-EIC 1700 SEARCH

IC ICM H01M010-40  
ICS H01M004-58; H01M004-62; H01M004-02; H01M002-02  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST secondary lithium battery sulfur  
compd additive enthalpy; electrolyte solvent enthalpy  
secondary lithium battery  
IT Battery electrolytes  
Enthalpy  
(enthalpy difference between neutral mol. and monovalent anion radical of solvent and additive in electrolytes for secondary lithium batteries)  
IT Secondary batteries  
(lithium; enthalpy difference between neutral mol. and monovalent anion radical of solvent and additive in electrolytes for secondary lithium batteries)  
IT 21324-40-3, Lithium hexafluorophosphate  
RL: DEV (Device component use); USES (Uses)  
(enthalpy difference between neutral mol. and monovalent anion radical of solvent and additive in electrolytes for secondary lithium batteries)  
IT 64-67-5, Diethyl sulfate 66-27-3, Methyl methanesulfonate 67-68-5, Dimethyl sulfoxide, uses 67-71-0, Dimethyl sulfone 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate 126-33-0, Sulfolane 616-42-2, Dimethyl sulfite 1120-71-4, 1,3-Propanesultone 1600-44-8, Tetramethylene sulfoxide 3741-38-6, Ethylene sulfite 478784-91-7, Ethylene glycol sulfate  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(enthalpy difference between neutral mol. and monovalent anion radical of solvent and additive in electrolytes for secondary lithium batteries)  
REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L132 ANSWER 7 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN  
ACCESSION NUMBER: 2002:773875 HCAPLUS Full-text  
DOCUMENT NUMBER: 137:313485  
TITLE: Organic electrolyte battery  
INVENTOR(S): Takahashi, Tadayoshi; Kawaguchi, Shinichi; Koshiba, Tokiharu  
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2002298911	A	20021011	JP 2001-95743	2001 0329

PRIORITY APPLN. INFO.: <--  
JP 2001-95743  
2001  
0329

ED Entered STN: 11 Oct 2002

# 10/658,272-266144-EIC 1700 SEARCH

AB The battery has a cathode, an anode, a separator, and an electrolyte in a housing containing a gasket between an anode case and a cathode case; where the electrolyte solution contains a LiBF<sub>4</sub>, benzenediolatoborate salt, or Li sulfonate salt dissolved in a Bu diglyme containing organic solvent. The gasket is preferably poly(phenylene sulfide), and the separator is poly(phenylene sulfide) or cellulose.

IT 126-33-0, Sulfolane 14283-07-9, Lithium fluoroborate 33454-82-9, Lithium trifluoromethanesulfonate 90076-65-6

RL: DEV (Device component use); USES (Uses)  
(organic solvent mixts containing Bu diglyme for lithium salt electrolyte solns. in secondary lithium batteries)

RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



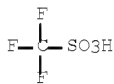
RN 14283-07-9 HCAPLUS

CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



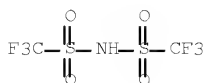
RN 33454-82-9 HCAPLUS

CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



RN 90076-65-6 HCAPLUS

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



IC ICM H01M010-40  
ICS H01M002-08  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST Battery electrolyte lithium salt org solvent butyl diglyme  
IT Polythiophenylenes  
RL: DEV (Device component use); USES (Uses)  
(gaskets and separators for secondary lithium batteries using electrolyte solns. containing Bu diglyme solvent)  
IT Secondary batteries  
(lithium; secondary lithium batteries using lithium salt electrolyte solution containing Bu diglyme solvent and poly(phenylene sulfide) gaskets and separators)  
IT Battery electrolytes  
(organic solvent mixts containing Bu diglyme for lithium salt electrolyte solns. in secondary lithium batteries)  
IT Secondary battery separators  
(poly(phenylene sulfide) and cellulose separators for secondary lithium batteries using electrolyte solns. containing Bu diglyme solvent)  
IT Gaskets  
(poly(phenylene sulfide) gaskets for secondary lithium batteries using electrolyte solns. containing Bu diglyme solvent)  
IT 9004-34-6, Cellulose, uses  
RL: DEV (Device component use); USES (Uses)  
(cellulose separators for secondary lithium batteries using electrolyte solns. containing Bu diglyme solvent)  
IT 112-34-5 126-33-0, Sulfolane 143-24-8, Tetraglyme 14283-07-9, Lithium fluoroborate 33454-82-9, Lithium trifluoromethanesulfonate 90076-65-6 132843-44-8 176719-70-3  
RL: DEV (Device component use); USES (Uses)  
(organic solvent mixts containing Bu diglyme for lithium salt electrolyte solns. in secondary lithium batteries)

L132 ANSWER 8 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN  
ACCESSION NUMBER: 2001:726702 HCAPLUS Full-text  
DOCUMENT NUMBER: 135:259876  
TITLE: Organic electrolyte batteries  
INVENTOR(S): Takahashi, Tadayoshi; Kawaguchi, Shinichi  
PATENT ASSIGNEE(S): Matsushita Electric Industrial Co., Ltd., Japan  
SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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JP 2001273926	A	20011005	JP 2000-88000	2000 0328

PRIORITY APPLN. INFO.: <-- JP 2000-88000

## 10/658,272-266144-EIC 1700 SEARCH

2000

0328

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ED Entered STN: 05 Oct 2001  
 AB The batteries have a cathode, an anode, a separator, and an electrolyte solution in a housing containing a cathode case, an anode case, and a gasket; where the electrolyte solution contains a LiBF<sub>4</sub> based solute dissolved in a tetraglyme based org. solvent.  
 IT 14283-07-9, Lithium fluoroborate  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte solns. containing lithium  
 fluoroborate dissolved in tetraglyme based solvent for  
 secondary lithium batteries)  
 RN 14283-07-9 HCAPLUS  
 CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)

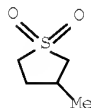


● Li+

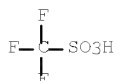
IT 126-33-0, Sulfolane 872-93-5, 3-Methyl sulfolane  
 33454-82-9, Lithium trifluoromethanesulfonate  
 RL: DEV (Device component use); USES (Uses)  
 (electrolyte solns. containing lithium  
 salts dissolved in tetraglyme based solvent for  
 secondary lithium batteries)  
 RN 126-33-0 HCAPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



RN 872-93-5 HCAPLUS  
 CN Thiophene, tetrahydro-3-methyl-, 1,1-dioxide (CA INDEX NAME)



RN 33454-82-9 HCAPLUS  
 CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



● Li

IC ICM H01M010-40  
ICS H01M006-16  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST battery electrolyte lithium  
fluoroborate tetraglyme solvent  
IT Battery electrolytes  
(electrolyte solns. containing lithium salts dissolved in tetraglyme based solvent for secondary lithium batteries)  
IT 14283-07-9, Lithium fluoroborate  
RL: DEV (Device component use); USES (Uses)  
(electrolyte solns. containing lithium fluoroborate dissolved in tetraglyme based solvent for secondary lithium batteries)  
IT 126-33-0, Sulfolane 143-24-8, Tetraglyme 372-93-5, 3-Methyl sulfolane 33454-82-9, Lithium trifluoromethanesulfonate  
RL: DEV (Device component use); USES (Uses)  
(electrolyte solns. containing lithium salts dissolved in tetraglyme based solvent for secondary lithium batteries)

L132 ANSWER 9 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN  
ACCESSION NUMBER: 2001:360327 HCAPLUS Full-text  
DOCUMENT NUMBER: 134:355483  
TITLE: Lithium batteries  
INVENTOR(S): Mikhaylik, Yuriy V.; Skotheim, Terje A.; Trofimov, Boris A.  
PATENT ASSIGNEE(S): Moltech Corporation, USA  
SOURCE: PCT Int. Appl., 37 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001035483	A1	20010517	WO 2000-US31047	2000 1110

&lt;--

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW  
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG  
EP 1232536 A1 20020821 EP 2000-980350

2000



## 10/658,272-266144-EIC 1700 SEARCH

1110

EP 1232536 B1 20050316  
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE,  
 MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR  
 JP 2003514356 T 20030415 JP 2001-537121

2000  
1110

US 6569573 B1 20030527 US 2000-709242

2000  
1110

US 20030180611 A1 20030925 US 2003-390516

2003  
0317

US 6936382 B2 20050830  
 PRIORITY APPLN. INFO.: US 1999-165368P P

1999  
1112

US 2000-709242 A1

2000  
1110

WO 2000-US31047 W

2000  
1110

OTHER SOURCE(S): MARPAT 134:355483

ED Entered STN: 18 May 2001

AB A lithium battery has the cathode comprising an electroactive sulfur-containing material and the electrolyte comprising a lithium salt, a noneq. solvent, and one or more capacity-enhancing reactive components. Suitable reactive components include electron transfer mediators. Also are provided methods for making the lithium battery.

IT 126-33-0, Sulfolane 10377-51-2, Lithium iodide 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 90076-65-6

RL: DEV (Device component use); USES (Uses)  
 (lithium batteries with sulfur-containing material cathode and lithium salt electrolyte)

RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



RN 10377-51-2 HCAPLUS

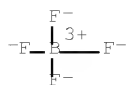
CN Lithium iodide (LiI) (CA INDEX NAME)

I-Li

RN 14283-07-9 HCAPLUS

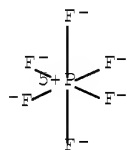
# 10/658,272-266144-EIC 1700 SEARCH

CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



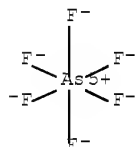
RN 21324-40-3 HCAPLUS

CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



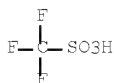
RN 29935-35-1 HCAPLUS

CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



RN 33454-82-9 HCAPLUS

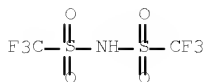
CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



RN 90076-65-6 HCAPLUS

## 10/658,272-266144-EIC 1700 SEARCH

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-  
, lithium salt (1:1) (CA INDEX NAME)



● Li

IC ICM H01M010-40  
ICS H01M010-42  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST lithium battery sulfur contg electroactive material  
IT Polysulfides  
RL: DEV (Device component use); USES (Uses)  
(alkyloxyalkyl derivs.; lithium batteries with sulfur-containing material cathode and lithium salt electrolyte)  
IT Ethers, uses  
RL: DEV (Device component use); USES (Uses)  
(cyclic; lithium batteries with sulfur-containing material cathode and lithium salt electrolyte)  
IT Battery cathodes  
Battery electrolytes  
(lithium batteries with sulfur-containing material cathode and lithium salt electrolyte)  
IT Ethers, uses  
Polyethers, uses  
Sulfones  
RL: DEV (Device component use); USES (Uses)  
(lithium batteries with sulfur-containing material cathode and lithium salt electrolyte)  
IT Carbon black, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(lithium batteries with sulfur-containing material cathode and lithium salt electrolyte)  
IT Secondary batteries  
(lithium; lithium batteries with sulfur-containing material cathode and lithium salt electrolyte)  
IT 110-71-4 126-33-0, Sulfolane 556-65-0, Lithium thiocyanate 646-06-0, Dioxolane 7550-35-8, Lithium bromide 7704-34-9, Sulfur, uses 10377-51-2, Lithium iodide 12798-95-7 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 23935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 39448-96-9, Graphite lithium 53680-59-4 69177-66-8 74432-42-1, Lithium polysulfide 90076-65-6 132404-42-3 339186-87-7  
RL: DEV (Device component use); USES (Uses)  
(lithium batteries with sulfur-containing material cathode and lithium salt electrolyte)  
IT 7440-44-0DP, Carbon, lithium-intercalated, uses

## 10/658,272-266144-EIC 1700 SEARCH

RL: DEV (Device component use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)  
(lithium batteries with sulfur-containing material cathode and lithium salt electrolyte)

IT 1942-52-5, 2-(Diethylamino) ethanethiol hydrochloride 7782-42-5, Graphite, uses 25085-35-2, Acrylic acid-ethyl acrylate copolymer 64265-57-2, Ionac PFAZ 322 339186-88-8

RL: MOA (Modifier or additive use); USES (Uses)  
(lithium batteries with sulfur-containing material cathode and lithium salt electrolyte)

REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L132 ANSWER 10 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2001:360320 HCAPLUS Full-text

DOCUMENT NUMBER: 134:355476

TITLE: Lithium primary batteries

INVENTOR(S): Mikhaylik, Yuriy V.; Skotheim, Terje A.; Angell, Charles A.

PATENT ASSIGNEE(S): Moltech Corporation, USA

SOURCE: PCT Int. Appl., 35 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001035475	A1	20010517	WO 2000-US30911	2000 1110

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W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.: US 1999-165154P P  
1999  
1112

<--

OTHER SOURCE(S): MARPAT 134:355476

ED Entered STN: 18 May 2001

AB In a lithium primary battery, the cathode comprises an electroactive sulfur-containing material and the electrolyte comprises one or more aonaq. solvents and one or more voltage-enhancing reactive components, wherein the reactive components are non-electroactive but enhance the voltage of the lithium primary battery. Suitable voltage-enhancing reactive components include organic halides, inorg. halides, and phosphorus chalcogenides. Also are provided methods for making the lithium primary battery.

IT 10377-51-2, Lithium iodide 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 90076-65-6

RL: DEV (Device component use); USES (Uses)  
(lithium primary batteries with

# 10/658,272-266144-EIC 1700 SEARCH

electroactive sulfur-containing material cathode and  
electrolyte with voltage-enhancing reactive components)

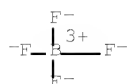
RN 10377-51-2 HCAPLUS

CN Lithium iodide (LiI) (CA INDEX NAME)



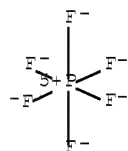
RN 14283-07-9 HCAPLUS

CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



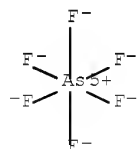
RN 21324-40-3 HCAPLUS

CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



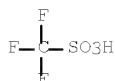
RN 29935-35-1 HCAPLUS

CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)

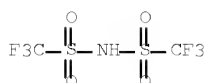


RN 33454-82-9 HCAPLUS

CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



RN 90076-65-6 HCAPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-  
 , lithium salt (1:1) (CA INDEX NAME)



IT 126-33-0, Sulfolane  
 RL: DEV (Device component use); TEM (Technical or engineered  
 material use); USES (Uses)  
 (lithium primary batteries with  
 electroactive sulfur-containing material cathode and  
 electrolyte with voltage-enhancing reactive components)  
 RN 126-33-0 HCAPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M006-16  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
 Technology)  
 ST lithium primary battery  
 IT Primary batteries  
 (button-type; lithium primary batteries  
 with electroactive sulfur-containing material cathode and  
 electrolyte with voltage-enhancing reactive components)  
 IT Ethers, uses  
 RL: DEV (Device component use); TEM (Technical or engineered  
 material use); USES (Uses)  
 (cyclic; lithium primary batteries with  
 electroactive sulfur-containing material cathode and  
 electrolyte with voltage-enhancing reactive components)  
 IT Battery cathodes  
 Battery electrolytes  
 (lithium primary batteries with  
 electroactive sulfur-containing material cathode and  
 electrolyte with voltage-enhancing reactive components)  
 IT Polysulfides  
 RL: DEV (Device component use); USES (Uses)  
 (lithium primary batteries with  
 electroactive sulfur-containing material cathode and

# 10/658,272-266144-EIC 1700 SEARCH

electrolyte with voltage-enhancing reactive components)

IT Esters, uses  
Ethers, uses  
Polyethers, uses  
Sulfites  
Sulfones  
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
(lithium primary batteries with electroactive sulfur-containing material cathode and electrolyte with voltage-enhancing reactive components)

IT Carbon black, uses  
Carbon fibers, uses  
Halides  
RL: MOA (Modifier or additive use); USES (Uses)  
(lithium primary batteries with electroactive sulfur-containing material cathode and electrolyte with voltage-enhancing reactive components)

IT Primary batteries  
(lithium; lithium primary batteries with electroactive sulfur-containing material cathode and electrolyte with voltage-enhancing reactive components)

IT Halides  
RL: MOA (Modifier or additive use); USES (Uses)  
(organic; lithium primary batteries with electroactive sulfur-containing material cathode and electrolyte with voltage-enhancing reactive components)

IT Hydrocarbons, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(perchlorocarbons; lithium primary batteries with electroactive sulfur-containing material cathode and electrolyte with voltage-enhancing reactive components)

IT Group VA element chalcogenides  
RL: MOA (Modifier or additive use); USES (Uses)  
(phosphorus chalcogenides; lithium primary batteries with electroactive sulfur-containing material cathode and electrolyte with voltage-enhancing reactive components)

IT 7439-93-2, Lithium, uses 7440-44-0D, Carbon, lithium intercalated, uses 7550-35-8, Lithium bromide 7704-34-9, Sulfur, uses 10377-51-2, Lithium iodide 12798-95-7 14283-07-9, Lithium tetrafluoroborate 21324-40-3, Lithium hexafluorophosphate 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium triflate 39448-96-9, Graphite lithium 53680-59-4 74432-42-1, Lithium polysulfide 90076-65-6 132404-42-3  
RL: DEV (Device component use); USES (Uses)  
(lithium primary batteries with electroactive sulfur-containing material cathode and electrolyte with voltage-enhancing reactive components)

IT 126-33-0, Sulfolane  
RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
(lithium primary batteries with electroactive sulfur-containing material cathode and electrolyte with voltage-enhancing reactive components)

IT 56-23-5, Carbon tetrachloride, uses 1314-56-3, Phosphorus oxide (P2O5), uses 1314-80-3, Phosphorus sulfide p2s5 2551-62-4, Sulfur hexafluoride 7446-70-0, Aluminum chloride, uses 7550-45-0, Titanium tetrachloride, uses 7637-07-2, Boron trifluoride, uses 7647-19-0, Phosphorus pentafluoride 7719-12-2, Phosphorus trichloride 7783-60-0, Sulfur tetrafluoride 7784-18-1, Aluminum fluoride 7786-30-3, Magnesium chloride, uses 10026-04-7, Silicon tetrachloride 10026-13-8, Phosphorus pentachloride 10294-34-5, Boron trichloride 16752-60-6, Phosphorus pentoxide dimer 158970-02-6, Phosphorus oxide sulfide

## 10/658,272-266144-EIC 1700 SEARCH

RL: MOA (Modifier or additive use); USES (Uses)

(lithium primary batteries with  
electroactive sulfur-containing material cathode and  
electrolyte with voltage-enhancing reactive components)REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L132 ANSWER 11 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2001:186088 HCAPLUS Full-text  
 DOCUMENT NUMBER: 134:210595  
 TITLE: Polymer electrolytes, nonaqueous electrolyte  
 solutions, and electric devices containing the  
 electrolytes  
 INVENTOR(S): Nishiura, Masahito; Kono, Michiyuki; Watanabe,  
 Masayoshi  
 PATENT ASSIGNEE(S): Dai-Ichi Kogyo Seiyaku Co., Ltd., Japan  
 SOURCE: PCT Int. Appl., 40 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2001018898	A1	20010315	WO 2000-JP5812	2000 0828
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W: CA, US				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
JP 2001072878	A	20010321	JP 1999-248890	1999 0902
<--				
JP 3557962	B2	20040825		
JP 2001076755	A	20010323	JP 1999-248891	1999 0902
<--				
CA 2344243	A1	20010315	CA 2000-2344243	2000 0828
<--				
CA 2344243	C	20060509		
EP 1130671	A1	20010905	EP 2000-955081	2000 0828
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R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
US 6673495	B1	20040106	US 2001-787231	2001 0425
<--				
US 40302	E1	20080506	US 2001-327829	2001 0425
<--				
PRIORITY APPLN. INFO.:			JP 1999-248890	A 1999 0902
<--				
			JP 1999-248891	A



## 10/658,272-266144-EIC 1700 SEARCH

1999

0902

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WO 2000-JP5812

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2000

0828

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US 2001-787231

E

2001

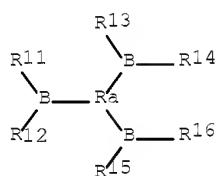
0425

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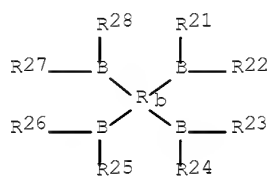
OTHER SOURCE(S): MARPAT 134:210595

ED Entered STN: 16 Mar 2001

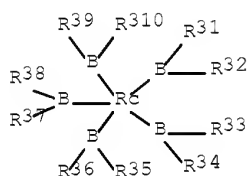
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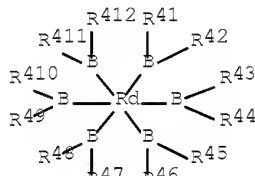
I



II



III



IV

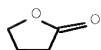
AB Polymer electrolytes contain an electrolyte salt, a polymer forming a complex with the salt and a B containing additive selected from I-IV, where R11-412 = H, halogen, a monovalent group, or bonded to another member of R11-412 to form a ring; and  $R_a$ ,  $R_b$ ,  $R_c$ , and  $R_d$  = groups connecting the B containing parts. The polymer electrolytes may contain a nonaq. solvent. The nonaq. electrolyte solns. has an electrolyte salt dissolved in a nonaq. solvent and contain the B containing additive. The elec. devices are batteries having the polymer electrolyte between a cathode and an anode, and are preferably secondary Li batteries.

IT 96-48-0,  $\gamma$ -Butyrolactone 126-33-0,  
Sulfolane 7447-41-8, Lithium chloride, uses  
7791-03-9, Lithium perchlorate  
10377-51-2, Lithium iodide 14283-07-9,  
Lithium fluoroborate 21324-40-3, Lithium  
hexafluorophosphate 29935-35-1, Lithium  
hexafluoroarsenate 33454-82-9, Lithium  
trifluoromethanesulfonate 90076-65-6

RL: DEV (Device component use); USES (Uses)  
(polymer electrolytes and nonaq. electrolyte solns.  
containing boron compound additives for secondary  
lithium batteries)

RN 96-48-0 HCAPLUS

CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



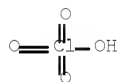
RN 126-33-0 HCAPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



RN 7447-41-8 HCAPLUS  
 CN Lithium chloride (LiCl) (CA INDEX NAME)



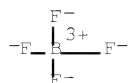
RN 7791-03-9 HCAPLUS  
 CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



RN 10377-51-2 HCAPLUS  
 CN Lithium iodide (LiI) (CA INDEX NAME)



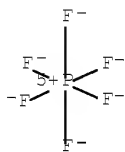
RN 14283-07-9 HCAPLUS  
 CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



RN 21324-40-3 HCAPLUS

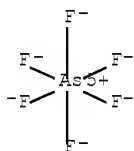
# 10/658,272-266144-EIC 1700 SEARCH

CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



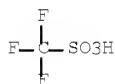
RN 29935-35-1 HCAPLUS

CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



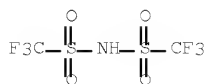
RN 33454-82-9 HCAPLUS

CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



RN 90076-65-6 HCAPLUS

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



## 10/658,272-266144-EIC 1700 SEARCH

IC ICM H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST secondary lithium battery  
 electrolyte boron compd additive  
 IT Battery electrolytes  
 (polymer electrolytes and nonaq. electrolyte solns. containing boron compound additives for secondary lithium batteries)  
 IT 328311-64-4 328311-65-5 328311-66-6 328311-67-7  
 328311-68-8 328311-69-9  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (boron compound additives in polymer electrolytes and nonaq. electrolyte solns. for secondary lithium batteries)  
 IT 96-48-0,  $\gamma$ -Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 108-32-7, Propylene carbonate 110-71-4 126-33-0, Sulfolane 616-38-6, Dimethyl carbonate 623-53-0, Ethyl methyl carbonate 646-06-0, 1,3-Dioxolane 7447-41-8, Lithium chloride, uses 7550-35-8, Lithium bromide 7789-24-4, Lithium fluoride, uses 7791-03-9, Lithium perchlorate 10377-81-2, Lithium iodide 14283-07-9, Lithium fluoroborate 21224-40-3, Lithium hexafluorophosphate 26570-48-9 29935-35-1, Lithium hexafluoroarsenate 33454-82-9, Lithium trifluoromethanesulfonate 90076-65-6  
 111804-95-6 132404-42-3 132843-44-8 152986-27-1  
 328312-84-1 328312-85-2 328312-86-3 328312-89-6  
 328312-90-9 328396-49-2 328396-51-6  
 RL: DEV (Device component use); USES (Uses)  
 (polymer electrolytes and nonaq. electrolyte solns. containing boron compound additives for secondary lithium batteries)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L132 ANSWER 12 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2000:861126 HCAPLUS Full-text

DOCUMENT NUMBER: 134:7008

TITLE: Nonaqueous electrolyte battery

INVENTOR(S): Yamaura, Kiyoshi

PATENT ASSIGNEE(S): Sony Corp., Japan

SOURCE: Eur. Pat. Appl., 12 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 1058325	A2	20001206	EP 2000-111667	2000 0531
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EP 1058325	A3	20031203		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
JP 2000348722	A	20001215	JP 1999-158355	1999 0604
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US 6627351	B1	20030930	US 2000-586895	

## 10/658,272-266144-EIC 1700 SEARCH

2000  
0605

PRIORITY APPLN. INFO.:

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JP 1999-158355 A1999  
0604

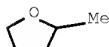
ED Entered STN: 08 Dec 2000

AB A nonaq. electrolyte battery free from considerable change in the structure of a cathode active material thereof to enlarge the capacity thereof, incorporating a cathode containing a cathode active material; an anode containing an anode active material to which Li can be doped/dedoped; and a nonaq. electrolyte disposed between the cathode and the anode and containing nonaq. solvent and an electrolyte, wherein a material expressed by general formula  $\text{LiMn}_{1-y}\text{Al}_y\text{O}_2$  ( $0.06 \leq y < 0.25$ ) is contained as the cathode active material and  $\text{LiMn}_{1-y}\text{Al}_y\text{O}_2$  has a crystalline structure expressed by spatial group C2/m.

IT 96-47-9, 2-Methyltetrahydrofuran 96-48-0,  
 $\gamma$ -Butyrolactone 109-99-9, Thf, uses  
126-33-0, Sulfolane 7447-41-8, Lithium chloride,  
uses 7791-03-9, Lithium perchlorate  
14283-07-9, Lithium tetrafluoroborate  
21324-40-3, Lithium hexafluorophosphate  
29935-35-1, Lithium hexafluoroarsenate  
33453-82-9, Lithium trifluoromethanesulfonate  
35678-71-8, Methylsulfolane  
RL: DEV (Device component use); USES (Uses)  
(nonaq. electrolyte battery)

RN 96-47-9 HCAPLUS

CN Furan, tetrahydro-2-methyl- (CA INDEX NAME)



RN 96-48-0 HCAPLUS

CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



RN 109-99-9 HCAPLUS

CN Furan, tetrahydro- (CA INDEX NAME)



RN 126-33-0 HCAPLUS

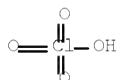
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



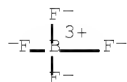
RN 7447-41-8 HCAPLUS  
 CN Lithium chloride (LiCl) (CA INDEX NAME)



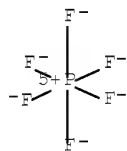
RN 7791-03-9 HCAPLUS  
 CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



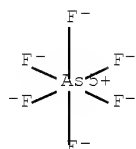
RN 14283-07-9 HCAPLUS  
 CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



RN 21324-40-3 HCAPLUS  
 CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)

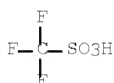


RN 29935-35-1 HCAPLUS  
 CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



● Li<sup>+</sup>

RN 33454-82-9 HCAPLUS  
 CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



● Li

RN 35678-71-8 HCAPLUS  
 CN Thiophene, tetrahydromethyl-, 1,1-dioxide (CA INDEX NAME)



D1-Me

IC ICM H01M004-48  
 ICS H01M004-50  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST nonaq electrolyte lithium battery;  
 aluminum lithium manganese oxide cathode battery  
 IT Battery cathodes  
 (aluminum lithium manganese oxide; nonaq. electrolyte battery)  
 IT Secondary batteries  
 (lithium; nonaq. electrolyte battery)  
 IT Lithium alloy  
 RL: DEV (Device component use); USES (Uses)  
 (nonaq. electrolyte battery)  
 IT 60-29-7, Diethyl ether, uses 75-05-8, Acetonitrile, uses 96-47-9, 2-Methyltetrahydrofuran 96-48-0,  
 γ-Butyrolactone 96-49-1, Ethylene carbonate 100-66-3,  
 Anisole, uses 105-58-8, Diethyl carbonate 107-12-0,  
 Propionitrile 109-99-9, Thf, uses 110-71-4,  
 1,2-Dimethoxyethane 126-33-0, Sulfolane 616-38-6,  
 Dimethyl carbonate 629-14-1, 1,2-Diethoxyethane 646-06-0,

## 10/658,272-266144-EIC 1700 SEARCH

1,3-Dioxolane 1072-47-5, 4-Methyl-1,3-dioxolane 2550-62-1,  
 Lithium methanesulfonate 7439-93-2, Lithium,  
 uses 7447-41-8, Lithium chloride, uses 7550-35-8,  
 lithium bromide 7791-03-9, lithium  
 perchlorate 14283-07-9, lithium  
 tetrafluoroborate 14485-20-2, Lithium  
 tetraphenylborate 21324-40-3, Lithium  
 hexafluorophosphate 29935-35-1, Lithium  
 hexafluoroarsenate 33454-82-9, Lithium  
 trifluoromethanesulfonate 35678-71-8, Methylsulfolane  
 110320-40-6, Polypropylene carbonate  
 RL: DEV (Device component use); USES (Uses)  
 (nonaq. electrolyte battery)

L132 ANSWER 13 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2000:629942 HCAPLUS Full-text  
 DOCUMENT NUMBER: 133:180331  
 TITLE: Manufacture of lithium ion  
 battery  
 INVENTOR(S): Yang, Hanxi; Dong, Quanfeng; Ai, Xinpeng  
 PATENT ASSIGNEE(S): Wuhan University, Peop. Rep. China  
 SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 5  
 pp.  
 CODEN: CNXXEV  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Chinese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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CN 1241041	A	20000112	CN 1998-113625	1998 0708
			<--	
CN 1107356	C	20030430		
PRIORITY APPLN. INFO.:			CN 1998-113625	1998 0708
			<--	

ED Entered STN: 12 Sep 2000

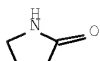
AB The diaphragm of the battery is manufactured by dissolving copolymer in organic solvent, mixing with additive, preparing thin film (5-250  $\mu$ m) by screen-printing or coating method, and drying at 30-100° in vacuum. The cathode film of the battery is manufactured by mixing LiMn2O4, LiCoO2, or LiNiO2, acetylene black, copolymer, and pore-forming agent at 10:(1-5):(1-8):(1-6), coating the mixture onto metal foil or metal gauze, and drying at 30-100° in vacuum. The anode film is manufactured by mixing graphite or coke, acetylene black, copolymer, and pore forming agent at 10:(1-3):(1-8):(1-8), coating the mixture onto metal foil or gauze, and drying at 30-100° in vacuum. The battery is manufactured by laminating the cathode film, diaphragm, and anode film; filling electrolyte; drying to obtain dry-state film battery; and cutting. The copolymer is vinylidene fluoride-hexafluoropropylene copolymer; the organic solvent is selected from THF, Me sulfoxide, N,N-DMF, acetone, methylethyl ketone, pyrrolidone, cyclohexanone, and butanone; the additive is from camphor, naphthalene, anthracene, phenanthrene, and their derivs.

IT 616-45-5, Pyrrolidone  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (solvent; in manufacture of lithium ion  
 battery)

RN 616-45-5 HCAPLUS

CN 2-Pyrrolidinone (CA INDEX NAME)





IC ICM H01M010-38  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST lithium ion battery manuf  
 IT Coating process  
 Screen printing  
 (in manufacture of lithium ion battery)  
 )  
 IT Carbon black, uses  
 Coke  
 RL: DEV (Device component use); USES (Uses)  
 (in manufacture of lithium ion battery)  
 )  
 IT Battery anodes  
 Battery cathodes  
 Secondary batteries  
 Secondary battery separators  
 (manufacture of lithium ion battery)  
 IT 76-22-2, Camphor 85-01-8, Phenanthrene, uses 91-20-3,  
 Naphthalene, uses 120-12-7, Anthracene, uses 7782-42-5,  
 Graphite, uses 9011-17-0, Hexafluoropropylene-vinylidene  
 fluoride copolymer 12031-65-1, Lithium nickel oxide (LiNiO<sub>2</sub>)  
 12057-17-9, Lithium manganese oxide (LiMn<sub>2</sub>O<sub>4</sub>)  
 RL: DEV (Device component use); USES (Uses)  
 (in manufacture of lithium ion battery)  
 )  
 IT 67-64-1, Acetone, uses 67-68-5, Methyl sulfoxide, uses  
 68-12-2, N,N-Dimethyl formamide, uses 78-93-3, Methyleneethyl  
 ketone, uses 616-45-5, Pyrrolidone  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (solvent; in manufacture of lithium ion  
 battery)

L132 ANSWER 14 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2000:421456 HCAPLUS Full-text  
 DOCUMENT NUMBER: 133:32706  
 TITLE: Nonaqueous electrolytes for batteries  
 INVENTOR(S): Mikhaylik, Yuriy V.; Skotheim, Terje A.;  
 Gorkovenko, Alexander A.  
 PATENT ASSIGNEE(S): Moltech Corp., USA  
 SOURCE: PCT Int. Appl., 51 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2000036683	A2	20000622	WO 1999-US30116	1999 1216

&lt;--

WO 2000036683 A3 20001109  
 W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR,  
 CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR,  
 HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,  
 LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL,

## 10/658,272-266144-EIC 1700 SEARCH

PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ,  
 UA, UG, US, UZ, VN, YU, ZA, ZW  
 RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH,  
 CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT,  
 SE, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN,  
 TD, TG

EP 1149428 A2 20011031 EP 1999-967390 1999  
 1216

&lt;--

EP 1149428 B1 20030319  
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE,  
 MC, PT, IE, SI, LT, LV, FI, RO

PRIORITY APPLN. INFO.: US 1998-215115 A2 1998  
 1217

&lt;--

WO 1999-US30116 W 1999  
 1216

&lt;--

ED Entered STN: 23 Jun 2000

AB The present invention relates generally to the field of nonaq. electrolytes for use in elec. current producing cells. More particularly, the present invention pertains to nonaq. electrolytes comprising a highly concentrated solution of one or more lithium salts in one or more nonaq. solvents. More specifically, the present invention pertains to nonaq. electrolytes, suitable for use in an elec. current producing cell, comprising: (a) one or more lithium salts, dissolved in (b) one or more nonaq. oxygen-containing solvents; wherein the concentration of the one or more lithium salts is: (i) >110% of the molar concentration of the one or more lithium salts which would provide maximum ionic conductivity at 25° in the one or more solvents; and, (ii) >1.3M. The present invention also pertains to elec. current producing cells comprising such nonaq. electrolytes, and methods for increasing the safety and cycle life of an elec. current producing cell.

IT 77-79-2, 3-Sulfolene 96-47-9,  
 2-Methyltetrahydrofuran 109-99-9, uses 126-33-0  
 872-93-5, 3-Methylsulfolane 10377-51-2,  
 Lithium iodide 23454-82-9, Lithium  
 triflate 90076-65-6 274251-47-7  
 RL: DEV (Device component use); TEM (Technical or engineered  
 material use); USES (Uses)  
 (nonaq. electrolytes for batteries)

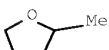
RN 77-79-2 HCAPLUS

CN Thiophene, 2,5-dihydro-, 1,1-dioxide (CA INDEX NAME)



RN 96-47-9 HCAPLUS

CN Furan, tetrahydro-2-methyl- (CA INDEX NAME)



RN 109-99-9 HCAPLUS

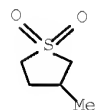
CN Furan, tetrahydro- (CA INDEX NAME)



RN 126-33-0 HCAPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



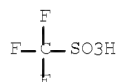
RN 872-93-5 HCAPLUS  
 CN Thiophene, tetrahydro-3-methyl-, 1,1-dioxide (CA INDEX NAME)



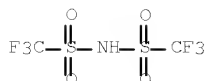
RN 10377-51-2 HCAPLUS  
 CN Lithium iodide (LiI) (CA INDEX NAME)



RN 33454-82-9 HCAPLUS  
 CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



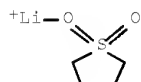
RN 90076-65-6 HCAPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



RN 274251-47-7 HCAPLUS  
 CN Lithium(1+), [tetrahydrothiophene 1-(oxide-κO) 1-oxide]-,  
 salt with 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]methanesulf  
 onamide (1:1) (9CI) (CA INDEX NAME)

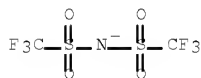
CM 1

CRN 274251-46-6  
 CMF C4 H8 Li O2 S  
 CCI CCS



CM 2

CRN 98837-98-0  
 CMF C2 F6 N O4 S2



IC ICM H01M010-40  
 ICS H01M004-58  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
 Technology)  
 IT Battery cathodes  
 Battery electrolytes  
 Secondary batteries  
 Solvates  
 (nonaq. electrolytes for batteries)  
 IT 7439-93-2, Lithium, uses 7440-44-0D, Carbon,  
 lithium-intercalated, uses 7704-34-9, Sulfur, uses 12798-95-7  
 39448-96-9, Graphite lithium 53680-59-4  
 RL: DEV (Device component use); USES (Uses)  
 (nonaq. electrolytes for batteries)  
 IT 60-29-7, Diethyl ether, uses 77-79-2, 3-Sulfolene  
 96-47-9, 2-Methyltetrahydrofuran 108-20-3, Diisopropyl  
 ether 109-87-5, Dimethoxymethane 109-99-9, uses  
 110-71-4, Ethylene glycol dimethyl ether 111-43-3, Dipropyl  
 ether 111-96-6, Diethylene glycol dimethyl ether 112-49-2,  
 Triethylene glycol dimethyl ether 115-10-6, Dimethyl ether  
 123-91-1, 1,4-Dioxane, uses 126-33-8 142-68-7,  
 Tetrahydropyran 142-96-1, Dibutyl ether 143-24-8,

# 10/658,272-266144-EIC 1700 SEARCH

TetraEthylene glycol dimethyl ether 149-73-5, Trimethoxymethane  
 505-22-6, 1,3-Dioxane 505-65-7, 1,3-Dioxepane 505-68-0,  
 1,4-Dioxepane 556-65-0, Lithium thiocyanate  
 592-90-5, Oxepane 872-92-9, 3-Methylsulfolane  
 1634-04-4, Methyl tert-butyl ether 6572-91-4, 1,4-Dioxocane  
 7778-85-0, Propylene glycol dimethyl ether 10143-60-9,  
 Bis(2-ethylhexyl)ether 10377-51-2, Lithium  
 iodide 25190-06-1 33454-82-9, Lithium  
 triflate 74432-42-1, Lithium polysulfide  
 90076-65-6 111109-77-4, DiPropylene glycol dimethyl  
 ether 132404-42-3 274251-44-4 274251-45-5  
 274251-47-7 274251-48-8 274251-49-9  
 RL: DEV (Device component use); TEM (Technical or engineered  
 material use); USES (Uses)  
 (nonaq. electrolytes for batteries)

L132 ANSWER 15 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2000:166260 HCAPLUS Full-text  
 DOCUMENT NUMBER: 132:196755  
 TITLE: Nonaqueous-electrolyte batteries using  
 sulfolane or sultone analogs  
 INVENTOR(S): Ochiai, Seijiro; Kobayashi, Aya; Inamasu,  
 Tokuo  
 PATENT ASSIGNEE(S): Yuasa Battery Co., Ltd., Japan  
 SOURCE: Jpn. Kokai Tokkyo Koho, 5 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
JP 2000077098	A	20000314	JP 1998-242729	1998 0828

PRIORITY APPLN. INFO.: <--  
 JP 1998-242729  
 1998  
 0828

OTHER SOURCE(S): MARPAT 132:196755

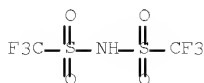
ED Entered STN: 14 Mar 2000

AB The batteries are equipped with cathodes containing Al or Al alloy current collectors and electrolyte solns. or polymer gel electrolytes containing (1) LiOSO<sub>2</sub>Rf<sub>1</sub>, (2) LiN(SO<sub>2</sub>Rf<sub>2</sub>)(SO<sub>2</sub>Rf<sub>3</sub>), and/or (3) LiC(SO<sub>2</sub>Rf<sub>4</sub>)(SO<sub>2</sub>Rf<sub>5</sub>)(SO<sub>2</sub>Rf<sub>6</sub>) (where Rf<sub>1-6</sub> = F, CkF<sub>2k+1</sub>, OCmH<sub>2m</sub>CnF<sub>2n+1</sub>; k = 1-5; m = 1 or 2; n = 1-5) and solvents containing sulfolane or sultone-analogs. The batteries have high safety and reliability.

IT 90076-65-6, Lithium bis(trifluoromethylsulfonyl)imide  
 RL: DEV (Device component use); USES (Uses)  
 (electrolytes; electrolytes containing sulfonyl-type Li salts and  
 sulfolane or sultone analogs for nonaq. batteries)

RN 90076-65-6 HCAPLUS

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-  
 , lithium salt (1:1) (CA INDEX NAME)



● Li

IT 126-33-0, Sulfolane  
 RL: DEV (Device component use); USES (Uses)  
 (solvents; electrolytes containing sulfonyl-type Li salts and  
 sulfolane or sultone analogs for nonaq. batteries)  
 RN 126-33-0 HCAPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M010-40  
 ICS C07D327-04; C07D333-48; H01B001-12; H01M004-66; H01M006-16  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
 Technology)  
 ST sulfolane solvent nonaq electrolyte battery  
 safety; sultone solvent nonaq electrolyte  
 battery; lithium sulfonylimide electrolyte  
 battery  
 IT Battery electrolytes  
 (electrolytes containing sulfonyl-type Li salts and sulfolane or  
 sultone analogs for nonaq. batteries)  
 IT Secondary batteries  
 (lithium; electrolytes containing sulfonyl-type  
 Li salts and sulfolane or sultone analogs for nonaq. batteries)  
 IT Aluminum alloy  
 RL: DEV (Device component use); USES (Uses)  
 (current collectors in cathodes; electrolytes containing  
 sulfonyl-type Li salts and sulfolane or sultone analogs for  
 nonaq. batteries)  
 IT 7429-90-5, Aluminum, uses  
 RL: DEV (Device component use); USES (Uses)  
 (current collectors in cathodes; electrolytes containing  
 sulfonyl-type Li salts and sulfolane or sultone analogs for  
 nonaq. batteries)  
 IT 90076-65-6, Lithium bis(trifluoromethylsulfonyl)imide  
 RL: DEV (Device component use); USES (Uses)  
 (electrolytes; electrolytes containing sulfonyl-type Li salts and  
 sulfolane or sultone analogs for nonaq. batteries)  
 IT 126-33-0, Sulfolane 1120-71-4D, Propane sultone, derivs.  
 RL: DEV (Device component use); USES (Uses)  
 (solvents; electrolytes containing sulfonyl-type Li salts and  
 sulfolane or sultone analogs for nonaq. batteries)

L132 ANSWER 16 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1999:460492 HCAPLUS Full-text

DOCUMENT NUMBER: 131:90284

TITLE: Flame-resistant organic electrolytes for  
 nonaqueous secondary battery

INVENTOR(S): Usami, Kyohei; Ito, Miho; Kubota, Naohiro;  
 Mashimo, Shinya

PATENT ASSIGNEE(S): Denso Corporation, Japan; Asahi Denka Kogyo  
 Kabushiki Kaisha

SOURCE: Fr. Demande, 19 pp.

CODEN: FRXXBL

DOCUMENT TYPE: Patent

LANGUAGE: French

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

## 10/658,272-266144-EIC 1700 SEARCH

PATENT NO. -----	KIND ----	DATE -----	APPLICATION NO. -----	DATE
FR 2772390	A1	19990618	FR 1998-15228	1998 1202
			<--	
FR 2772390	B1	20010302		
JP 11233141	A	19990827	JP 1998-342065	1998 1201
			<--	
US 6210840	B1	20010403	US 1998-201667	1998 1201
			<--	
PRIORITY APPLN. INFO.:			JP 1997-331538	A 1997 1202
			<--	

OTHER SOURCE(S): MARPAT 131:90284

ED Entered STN: 28 Jul 1999

AB Flame-resistant electrolytes are described for use in secondary batteries, especially secondary lithium batteries with high energy d., comprising an organic solvent containing a salt and 5-100 weight% of a phosphonate or phosphinate of general formula (R1)nP:O(OR2)m, where R1 is C1-8-alkyl, alkyl halide, aryl, aralkyl, or -CH2COOR3 (R3 is C1-8-alkyl or alkyl halide); R2 is Me, Et, C1-8-alkyl halide; m,n=1,2; m+n=3. The organic solvents can be carbonates (e.g., ethylene carbonate and di-Et carbonate), lactones, ethers, sulfolanes or dioxolanes and the salts can be LiPF6, LiBF4, LiClO4, LiAsF6, LiSO3CF3, LiN(CF3SO2)2, LiC(CF3SO2)3.

IT 872-50-4, N-Methyl-2-pyrrolidone, uses  
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)  
 (nonflammable organic electrolytes for nonaq. secondary battery)

RN 872-50-4 HCAPLUS

CN 2-Pyrrolidinone, 1-methyl- (CA INDEX NAME)



IT 126-33-0, Sulfolane 7791-03-9 14283-07-9  
 , Lithium tetrafluoroborate LiBF4 21324-40-3, Lithium hexafluorophosphate LiPF6 29935-35-1, Lithium hexafluoroarsenate LiAsF6 33454-82-9, Lithium trifluoromethanesulfonate 90076-65-6, Lithium bis(trifluoromethylsulfonyl)amide  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (nonflammable organic electrolytes for nonaq. secondary battery)

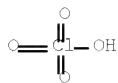
RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)

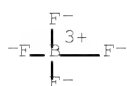


# 10/658,272-266144-EIC 1700 SEARCH

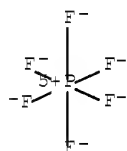
RN 7791-03-9 HCAPLUS  
CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



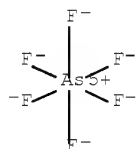
RN 14283-07-9 HCAPLUS  
CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



RN 21324-40-3 HCAPLUS  
CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



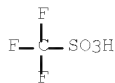
RN 29935-35-1 HCAPLUS  
CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



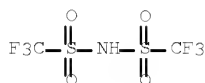


## 10/658,272-266144-EIC 1700 SEARCH

RN 33454-82-9 HCAPLUS  
 CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



RN 90076-65-6 HCAPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



IC ICM C09K021-12  
 ICS H01M002-00  
 ICA C07F009-02  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 ST electrolyte flame resistant nonaq secondary battery; battery secondary nonflammable nonaq electrolyte; lithium secondary battery nonflammable nonaq electrolyte; safety nonflammable secondary battery electrolyte  
 IT Secondary batteries (lithium; nonflammable organic electrolytes for nonaq. secondary battery)  
 IT Battery electrolytes  
 Fire-resistant materials  
 Safety Secondary batteries (nonflammable organic electrolytes for nonaq. secondary battery)  
 IT Fluoropolymers, uses  
 RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses) (nonflammable organic electrolytes for nonaq. secondary battery)  
 IT Carbonates, uses  
 Ethers, uses  
 Lactones  
 RL: NUU (Other use, unclassified); USES (Uses) (nonflammable organic electrolytes for nonaq. secondary battery)  
 IT Solvents (organic; nonflammable organic electrolytes for nonaq. secondary battery)  
 IT 7440-50-8, Copper, uses

## 10/658,272-266144-EIC 1700 SEARCH

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(anode; nonflammable organic electrolytes for nonaq. secondary battery)

IT 7429-90-5, Aluminum, uses 12190-79-3, Lithium cobalt oxide LiCoO2

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(cathode; nonflammable organic electrolytes for nonaq. secondary battery)

IT 832-50-4, N-Methyl-2-pyrrolidone, uses 7782-42-5, Graphite, uses 24937-79-9

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(nonflammable organic electrolytes for nonaq. secondary battery)

IT 649-68-3 650-16-8 683-08-9, Diethylmethane phosphonate 756-79-6, Dimethylmethane phosphonate 757-95-9 867-13-0 2240-41-7, Dimethylbenzene phosphonate 6163-75-3, Dimethylethane phosphonate 14337-77-0, Phosphinic acid, dimethyl-, methyl ester 71544-99-5 130522-75-7, Phosphonic acid, methylphenyl, Dimethyl ester 230310-88-0

RL: MOA (Modifier or additive use); USES (Uses)

(nonflammable organic electrolytes for nonaq. secondary battery)

IT 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate

126-33-0, Sulfolane 646-06-0, Dioxolane

7791-03-9 14283-07-9, Lithium tetrafluoroborate

LiBF4 21324-40-3, Lithium hexafluorophosphate LiPF6

39935-35-1, Lithium hexafluoroarsenate LiAsF6

33454-82-9, Lithium trifluoromethanesulfonate

90076-65-6, Lithium bis(trifluoromethylsulfonyl)amide

132404-42-3, Lithium tris(trifluoromethylsulfonyl)methanide

RL: NUU (Other use, unclassified); USES (Uses)

(nonflammable organic electrolytes for nonaq. secondary battery)

IT 9003-07-0, Polypropylene

RL: DEV (Device component use); TEM (Technical or engineered material use); USES (Uses)

(separator; nonflammable organic electrolytes for nonaq. secondary battery)

L132 ANSWER 17 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1999:224763 HCAPLUS Full-text

DOCUMENT NUMBER: 130:225404

TITLE: Nonaqueous electrolyte batteries

INVENTOR(S): Sato, Tomohiro; Mori, Shoichiro; Deshamps, Marc; Kotato, Minoru; Shima, Noriko; Suzuki, Hitoshi

PATENT ASSIGNEE(S): Mitsubishi Chemical Corporation, Japan

SOURCE: PCT Int. Appl., 39 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 9916144	A1	19990401	WO 1998-JP4181	

1998

0917

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W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD,

# 10/658,272-266144-EIC 1700 SEARCH

MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG,  
SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW  
RW: GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE,  
DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF,  
BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

JP 2002216841 A 20020802 JP 1997-278626  
1997  
1013

<--

JP 4085450 B2 20080514  
JP 2002216850 A 20020802 JP 1998-111794  
1998  
0422

<--

AU 9890951 A 19990412 AU 1998-90951  
1998  
0917

<--

JP 11162511 A 19990618 JP 1998-263140  
1998  
0917

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JP 3658506 B2 20050608  
EP 1030399 A1 20000823 EP 1998-943020  
1998  
0917

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R: DE  
CN 1134083 C 20040107 CN 1998-811216  
1998  
0917

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US 6670078 B1 20031230 US 2000-508108  
2000  
0719

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PRIORITY APPLN. INFO.: JP 1997-254802 A  
1997  
0919

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JP 1997-278626 A  
1997  
1013

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JP 1998-111794 A  
1998  
0422

<--

WO 1998-JP4181 W  
1998  
0917

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OTHER SOURCE(S): MARPAT 130:225404

ED Entered STIN: 12 Apr 1999

AB The batteries have a Li anode, a cathode, a nonaq. electrolyte containing a solute and an organic solvent, a separator, and a battery case; where the solvent contains a compound RAR' [R and R' are (aryl- or halogen-substituted) alkyl group or (alkyl- or halogen-substituted) aryl group; A = -OSO2-, -SO2-, -SO3-, or -SO4-; and R, R', and A may form a ring], and the cathode collector and the cathode side of the battery case contacting the electrolyte are composed of a metal, which forms a passivation film in electrolyte, or its alloy.

IT 77-79-2, Sulfolene 96-48-0,  $\gamma$ -  
Butyrolactone 109-99-9, Thf, uses 126-33-0,  
Sulfolane  
RL: DEV (Device component use); USES (Uses)  
(electrolyte solvents in lithium

# 10/658,272-266144-EIC 1700 SEARCH

batteries with readily passivated metals for  
cathode collectors and battery case linings)

RN 77-79-2 HCAPLUS

CN Thiophene, 2,5-dihydro-, 1,1-dioxide (CA INDEX NAME)



RN 96-48-0 HCAPLUS

CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



RN 109-99-9 HCAPLUS

CN Furan, tetrahydro- (CA INDEX NAME)



RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M010-40

ICS H01M004-64; H01M004-66

CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
Technology)

ST lithium battery electrolyte solvent  
organosulfur compd; cathode collector compn  
lithium battery; metal compn lithium  
battery case

IT Battery electrolytes  
(electrolyte solvents in lithium  
batteries with readily passivated metals for  
cathode collectors and battery case linings)

IT Secondary batteries  
(lithium; secondary lithium  
batteries with readily passivated metals for  
cathode collectors and battery case linings)

IT Battery cathodes  
(secondary lithium batteries with  
readily passivated metals for cathode collectors and  
battery case linings)

IT 77-79-2, Sulfolene 96-48-0, γ-

# 10/658,272-266144-EIC 1700 SEARCH

Butyrolactone 96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate 109-99-9, Thf, uses 126-33-0, Sulfolane 554-12-1, Methyl propionate 616-42-2, Dimethyl sulfite 1120-71-4, 1,3-Propanesultone 3741-38-6, Ethylene sulfite

RL: DEV (Device component use); USES (Uses)  
(electrolyte solvents in lithium batteries with readily passivated metals for cathode collectors and battery case linings)

IT 7429-90-5, Aluminum, uses 7440-03-1, Niobium, uses 7440-25-7, Tantalum, uses 7440-32-6, Titanium, uses 7440-58-6, Hafnium, uses 7440-67-7, Zirconium, uses

RL: DEV (Device component use); USES (Uses)  
(secondary lithium batteries with readily passivated metals for cathode collectors and battery case linings)

REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L132 ANSWER 18 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1999:175852 HCAPLUS Full-text

DOCUMENT NUMBER: 130:198791

TITLE: Rechargeable lithium battery with organic electrolyte and carbon anode

INVENTOR(S): Jehoulet, Christophe; Moteau, Cecile

PATENT ASSIGNEE(S): Alcatel, Fr.

SOURCE: Eur. Pat. Appl., 11 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: French

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 901180	A1	19990310	EP 1998-402068	1998 0817

<--

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO

FR 2767969	A1	19990305	FR 1997-10822	1997 0829
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FR 2767969	B1	19991015		
JP 11126632	A	19990511	JP 1998-241586	1998 0827

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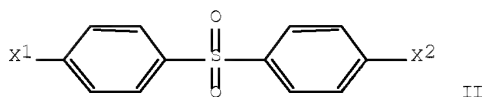
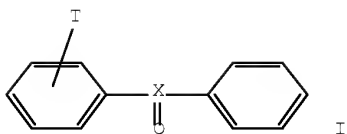
PRIORITY APPLN. INFO.:		FR 1997-10822	A	1997 0829
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OTHER SOURCE(S): MARPAT 130:198791

ED Entered STN: 17 Mar 1999

GI

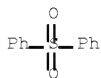


AB The Li secondary battery contains a Li cathode, a C anode, and an electrolyte containing a Li salt,  $\geq 1$  organic solvent, and an additive. The additive is an organic compound containing a X atom connected to  $\geq 1$  O atom or X-O bonds electronically conjugated with  $\geq 1$  unsatd. bond. The compound has a general formula (I) or (II) (X = S, C; T, X1, X2 = H, R, OH, OR, NH2, NHR, SH, SR, I, F, Cl, Br; R = C1-6 alkyl; T is in the ortho- or para- position).

IT 127-63-9, Diphenyl sulfone  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (in electrolyte for lithium  
 secondary batteries)

RN 127-63-9 HCAPLUS

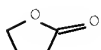
CN Benzene, 1,1'-sulfonylbis- (CA INDEX NAME)



IT 96-48-0,  $\gamma$ -Butyrolactone 109-99-9, uses  
 126-33-0, Sulfolane 872-50-4,  
 N-Methylpyrrolidone, uses 7791-03-9, Lithium  
 perchlorate 14283-07-9, Lithium  
 tetrafluoroborate 21324-40-3, Lithium  
 hexafluorophosphate 29935-35-1, Lithium  
 hexafluoroarsenate 33454-82-9, Lithium  
 trifluoromethanesulfonate 90076-65-6  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (in electrolyte for lithium  
 secondary batteries)

RN 96-48-0 HCAPLUS

CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



RN 109-99-9 HCAPLUS

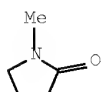
CN Furan, tetrahydro- (CA INDEX NAME)



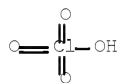
RN 126-33-0 HCAPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



RN 872-50-4 HCAPLUS  
 CN 2-Pyrrolidinone, 1-methyl- (CA INDEX NAME)



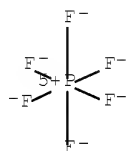
RN 7791-03-9 HCAPLUS  
 CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



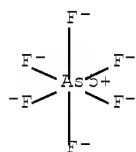
RN 14283-07-9 HCAPLUS  
 CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



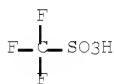
RN 21324-40-3 HCAPLUS  
 CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



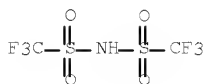
RN 29935-35-1 HCAPLUS  
 CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



RN 33454-82-9 HCAPLUS  
 CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



RN 90076-65-6 HCAPLUS  
 CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-, lithium salt (1:1) (CA INDEX NAME)



IC ICM H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)



## 10/658,272-266144-EIC 1700 SEARCH

ST battery electrolyte additive; lithium battery  
electrolyte additive carbon anode

IT Battery electrolytes  
(additive for)

IT Secondary batteries  
(lithium; rechargeable lithium  
battery with organic electrolyte and carbon anode)

IT 127-63-9, Diphenyl sulfone 945-51-7, Diphenyl sulfoxide  
RL: MOA (Modifier or additive use); USES (Uses)  
(in electrolyte for lithium  
secondary batteries)

IT 67-68-5, Dimethylsulfoxide, uses 68-12-2, Dimethylformamide,  
uses 75-05-8, Acetonitrile, uses 75-56-9, uses 79-16-3,  
N-Methylacetamide 96-48-0,  $\gamma$ -Butyrolactone  
96-49-1, Ethylene carbonate 105-58-8, Diethyl carbonate  
108-32-7, Propylene carbonate 109-99-9, uses 123-39-7,  
N-Methylformamide 126-33-0, Sulfolane 616-38-6,  
Dimethyl carbonate 616-42-2, Dimethyl sulfite 623-96-1,  
Dipropyl carbonate 646-06-0, 1,3-Dioxolane 872-50-4,  
N-Methylpyrrolidone, uses 7791-03-9, Lithium  
perchlorate 14283-07-9, Lithium  
tetrafluoroborate 21324-40-3, Lithium  
hexafluorophosphate 29935-35-1, Lithium  
hexafluoroarsenate 33454-82-9, Lithium  
trifluoromethanesulfonate 90076-65-6 133395-17-2  
RL: TEM (Technical or engineered material use); USES (Uses)  
(in electrolyte for lithium  
secondary batteries)

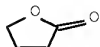
REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE  
FOR THIS RECORD. ALL CITATIONS AVAILABLE  
IN THE RE FORMAT

L132 ANSWER 19 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN  
ACCESSION NUMBER: 1993:675100 HCAPLUS Full-text  
DOCUMENT NUMBER: 119:275100  
ORIGINAL REFERENCE NO.: 119:49155a,49158a  
TITLE: Batteries with solid polymer electrolytes  
INVENTOR(S): Kono, Michiyuki; Mori, Shigeo; Takeda,  
Kazunari; Izuti, Shyuiti  
PATENT ASSIGNEE(S): Daiichi Kogyo Seiyaku Co., Ltd., Japan; Yuasa  
Corp.  
SOURCE: PCT Int. Appl., 29 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9314529	A1	19930722	WO 1993-JP64	1993 0120
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W: CA, US RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
JP 05198303	A	19930806	JP 1992-31451	1992 0121
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EP 576686	A1	19940105	EP 1993-902505	1993 0120
<--				

## 10/658,272-266144-EIC 1700 SEARCH

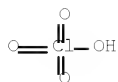
EP 576686 B1 20011010  
 R: DE, FR, GB  
 JP 07006787 A 19950110 JP 1993-26269 1993 0120  
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 JP 3290229 B2 20020610  
 CA 2106205 C 19991214 CA 1993-2106205 1993 0120  
 <--  
 US 5436090 A 19950725 US 1993-119214 1993 0921  
 <--  
 PRIORITY APPLN. INFO.: JP 1992-31451 A 1992 0121  
 <--  
 WO 1993-JP64 W 1993 0120  
 <--  
 ED Entered STN: 25 Dec 1993  
 AB The batteries use electrolytes obtained by crosslinking a mixture containing a trifunctional group polymer, an electrolyte salt, and a solvent by energy beam irradiation and/or heating; where the polymer contains 3 functional polymer chains of (CH<sub>2</sub>CH<sub>2</sub>O)<sub>m</sub>(CH<sub>2</sub>CRHO)<sub>n</sub>COCRL:CH<sub>2</sub> (R = C1-6 alkyl group, Rl = H or Me, m + n ≥ 35, and m or n may be 0), and the solvent is used at 220-950% the weight of the polymer. The batteries may use the electrolyte as separators and cathodes containing the electrolyte, or use anodes containing the electrolyte.  
 IT 96-48-0, γ-Butyrolactone 126-33-0, Sulfolan  
 RL: USES (Uses)  
 (electrolytes containing lithium salts and polyglycol triacrylates and, for batteries)  
 RN 96-48-0 HCAPLUS  
 CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



RN 126-33-0 HCAPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IT 7791-03-9, Lithium perchlorate  
 14283-07-9, Lithium fluoroborate  
 33454-32-9, Lithium trifluoromethanesulfonate  
 RL: USES (Uses)  
 (electrolytes containing polyglycol triacrylates and solvents and, for batteries)  
 RN 7791-03-9 HCAPLUS  
 CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



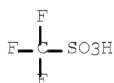
● Li

RN 14283-07-9 HCAPLUS  
 CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



● Li+

RN 33454-82-9 HCAPLUS  
 CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)



● Li

IC ICM H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
 Section cross-reference(s): 38  
 ST battery polyglycol triacrylate solid electrolyte; cathode polyglycol triacrylate electrolyte battery; anode polyglycol triacrylate electrolyte battery  
 IT Battery electrolytes  
     (lithium salt-crosslinked polyglycol triacrylate-organic solvent)  
 IT Cathodes  
     (battery, crosslinked polymer electrolyte-containing)  
 IT 1313-13-9, Manganese dioxide, uses 25233-30-1, Polyaniline  
 RL: USES (Uses)  
     (cathodes, containing crosslinked polymer electrolytes for batteries)  
 IT 52408-84-1 101661-95-4 111804-95-6 150604-31-2 150604-34-5  
     150604-35-6 151614-89-0  
 RL: USES (Uses)  
     (crosslinked, electrolyte containing lithium salts and solvents and, for batteries)  
 IT 96-48-0,  $\gamma$ -Butyrolactone 96-49-1,  
     1,3-Dioxolan-2-one 110-71-4, 1,2-Dimethoxyethane  
     126-33-0, Sulfolan

## 10/658,272-266144-EIC 1700 SEARCH

RL: USES (Uses)

(electrolytes containing lithium salts  
and polyglycol triacrylates and, for batteries)IT 556-65-0, Lithium thiocyanate 7791-03-9,  
Lithium perchlorate 14283-07-9, Lithium  
fluoroborate 33454-82-9, Lithium  
trifluoromethanesulfonate

RL: USES (Uses)

(electrolytes containing polyglycol triacrylates and  
solvents and, for batteries)

L132 ANSWER 20 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1993:452877 HCAPLUS Full-text

DOCUMENT NUMBER: 119:52877

ORIGINAL REFERENCE NO.: 119:9521a,9524a

TITLE: Nonaqueous electrolytes for high-energy  
batteries

INVENTOR(S): Webber, Andrew

PATENT ASSIGNEE(S): Eveready Battery Co., USA

SOURCE: Eur. Pat. Appl., 7 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 529802	A1	19930303	EP 1992-306734	1992 0723
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EP 529802	B1	20000419		
R: BE, FR, GB				
CA 2072488	A1	19930214	CA 1992-2072488	1992 0626
			<--	
CA 2072488	C	20021001		
JP 05198315	A	19930806	JP 1992-223146	1992 0710
			<--	
JP 3514478	B2	20040331		
HK 1007409	A1	20010803	HK 1998-106326	1998 0624
			<--	
PRIORITY APPLN. INFO.:			US 1991-744179	A 1991 0813
			<--	

ED Entered STN: 07 Aug 1993

AB The electrolytes comprise a solute dissolved in a 1:99 to 45:55 (weight ratio) mixture  
of a dioxolane-based and an acyclic ether solvent, and they contain <25 weight%  
cosolvent. The dioxolane-based solvent is dioxolane; the acyclic ether is Et glyme,  
diglyme, triglyme, and preferably DME; and the cosolvent is 3-methyl-2-oxazolidone,  
propylene carbonate, ethylene carbonate, butylene carbonate, sulfolane, and/or  
preferably 3,5-dimethylisoxazole. The preferred solute is LiCF<sub>3</sub>SO<sub>3</sub>, the anode of the  
batteries is Li, and their cathode is selected from fluorinated C, a metal sulfide, a  
metal oxide, and/or a metal chloride, and preferably FeS<sub>2</sub>.

IT 126-33-0, Sulfolane

RL: USES (Uses)

(electrolyte solvent mixts. of DME-dioxolane-, for  
lithium batteries)

RN 126-33-0 HCAPLUS

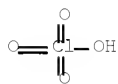
CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IT 7791-03-9, Lithium perchlorate  
 29935-35-1, Lithium hexafluoroarsenate  
 33454-82-9, Lithium trifluoromethanesulfonate  
 90076-65-6  
 RL: USES (Uses)  
 (electrolytes containing solvent mixts. and, for  
 lithium batteries)

RN 7791-03-9 HCAPLUS

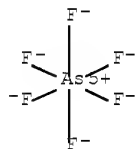
CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



● Li

RN 29935-35-1 HCAPLUS

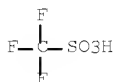
CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



● Li<sup>+</sup>

RN 33454-82-9 HCAPLUS

CN Methanesulfonic acid, 1,1,1-trifluoro-, lithium salt (1:1) (CA INDEX NAME)

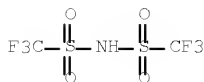


● Li

RN 90076-65-6 HCAPLUS

## 10/658,272-266144-EIC 1700 SEARCH

CN Methanesulfonamide, 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]-  
, lithium salt (1:1) (CA INDEX NAME)



● Li

IC ICM H01M006-16  
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)  
ST lithium battery nonaq  
electrolyte solvent; dioxolane acyclic ether  
electrolyte solvent; DME dioxolane battery electrolyte solvent;  
dimethylisoxazole DME dioxolane  
IT Battery electrolytes  
(dioxolane-acyclic ether solvent mixts. for lithium)  
IT 96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate  
126-33-0, Sulfolane 300-87-8, 3,5-Dimethylisoxazole  
4437-85-8, Butylene carbonate 19836-78-3  
RL: USES (Uses)  
(electrolyte solvent mixts. of DME-dioxolane-, for  
lithium batteries)  
IT 646-06-0, Dioxolane  
RL: USES (Uses)  
(electrolyte solvent mixts. of acyclic ether-dimethylisoxazole-  
, for lithium batteries)  
IT 110-71-4 111-96-6, Diglyme 112-49-2, Triglyme  
RL: USES (Uses)  
(electrolyte solvent mixts. of dioxolane-dimethylisoxazole-,  
for lithium batteries)  
IT 7791-03-9, Lithium perchlorate  
29935-35-1, Lithium hexafluoroarsenate  
33454-82-9, Lithium trifluoromethanesulfonate  
90076-65-6  
RL: USES (Uses)  
(electrolytes containing solvent mixts. and, for  
lithium batteries)

L132 ANSWER 21 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN  
ACCESSION NUMBER: 1991:517773 HCAPLUS Full-text  
DOCUMENT NUMBER: 115:117773  
ORIGINAL REFERENCE NO.: 115:20143a,20146a  
TITLE: Nonaqueous secondary battery  
INVENTOR(S): Eisenberg, Morris  
PATENT ASSIGNEE(S): Electrochimica Corp., USA  
SOURCE: U.S., 3 pp.  
CODEN: USXXAM  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	
US 5024906	A	19910618	US 1990-586295	1990 0921

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## 10/658,272-266144-EIC 1700 SEARCH

PRIORITY APPLN. INFO.:

US 1990-586295

1990

0921

&lt;--

ED Entered STN: 23 Sep 1991

AB An ionizing solvent of SO<sub>2</sub> and Me chloroformate, Et chloroformate, and/or sulfolane is added to an electrolyte containing a Lewis acid salt of an active metal anode. The addition of the solvent to the electrolyte prevents freezing of the electrolyte and increases battery performance and cathode capacity utilization.

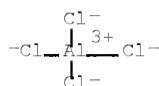
IT 14024-11-4, Lithium aluminum chloride (LiAlCl<sub>4</sub>)

RL: USES (Uses)

(electrolyte containing alkyl chloroformate or sulfolane and sulfur dioxide and, for batteries)

RN 14024-11-4 HCAPLUS

CN Aluminate(1-), tetrachloro-, lithium (1:1), (T-4)- (CA INDEX NAME)



IT 126-33-0, Sulfolane

RL: USES (Uses)

(electrolyte containing lithium salt and sulfur dioxide and, for batteries)

RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IC ICM H01M010-40

INCL 429101000

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST electrolyte solvent nonaq battery; methyl chloroformate battery electrolyte; ethyl chloroformate battery electrolyte; sulfolane battery electrolyte; sulfur dioxide battery electrolyte

IT Batteries, secondary

(lithium-copper chloride, with electrolyte containing alkyl chloroformate or sulfolane and lithium salt and sulfur dioxide, performance of)

IT 7446-09-5, Sulfur dioxide, uses and miscellaneous

RL: USES (Uses)

(electrolyte containing alkyl chloroformate or sulfolane and lithium salt and, for batteries)

IT 14024-11-4, Lithium aluminum chloride (LiAlCl<sub>4</sub>)

15138-76-8 15955-98-3

RL: USES (Uses)

(electrolyte containing alkyl chloroformate or sulfolane and sulfur dioxide and, for batteries)

IT 79-22-1, Methyl chloroformate 126-33-0, Sulfolane

## 10/658,272-266144-EIC 1700 SEARCH

541-41-3, Ethyl chloroformate  
 RL: USES (Uses)  
 (electrolyte containing lithium salt  
 and sulfur dioxide and, for batteries)

L132 ANSWER 22 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 1991:453399 HCAPLUS Full-text  
 DOCUMENT NUMBER: 115:53399  
 ORIGINAL REFERENCE NO.: 115:9221a,9224a  
 TITLE: Nonaqueous-electrolyte secondary  
 batteries  
 INVENTOR(S): Takami, Norio; Ohsaki, Takahisa; Inada,  
 Kuniaki; Kurisu, Norihito; Yamada, Shuji;  
 Takabayashi, Junichi  
 PATENT ASSIGNEE(S): Toshiba Corp., Japan; Toshiba Battery Co.,  
 Ltd.  
 SOURCE: Eur. Pat. Appl., 13 pp.  
 CODEN: EPXXDW  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO. -----	KIND ----	DATE -----	APPLICATION NO. -----	DATE
EP 398689	A2	19901122	EP 1990-305300	1990 0516
			<--	
EP 398689	A3	19920527		
EP 398689	B1	19950816		
R: DE, FR, GB				
JP 03049165	A	19910301	JP 1989-184245	1989 0717
			<--	
JP 03074061	A	19910328	JP 1989-215594	1989 0822
			<--	
JP 3017756	B2	20000313		
JP 03078976	A	19910404	JP 1989-215593	1989 0822
			<--	
CA 2016777	A1	19901116	CA 1990-2016777	1990 0515
			<--	
CA 2016777	C	19931012		
US 5079109	A	19920107	US 1990-523569	1990 0515
			<--	
JP 03250565	A	19911108	JP 1990-193840	1990 0724
			<--	
JP 3128230	B2	20010129		
PRIORITY APPLN. INFO.:			JP 1989-122604	A 1989 0516
			<--	
			JP 1989-215594	A 1989 0822



## 10/658,272-266144-EIC 1700 SEARCH

<--  
 JP 1989-184245 A  
 1989  
 0717  
 <--  
 JP 1989-215592 A  
 1989  
 0822  
 <--  
 JP 1989-215593 A  
 1989  
 0822  
 <--  
 JP 1990-2557  
 1990  
 0111  
 <--

ED Entered STN: 10 Aug 1991

AB The batteries comprise a Li-containing cathode housed in a case, a Li anode arranged in the case so that a separator is sandwiched between the anode and cathode, and a nonaq. electrolyte. The electrolyte is prepared by dissolving an electrolytic salt (e.g., LiPF<sub>6</sub> or LiBF<sub>4</sub>) in a solvent mixture comprising ethylene carbonate, 2-methyltetrahydrofuran, and ≥1 ester- and/or ether-based nonaq. solvents. Batteries using these electrolyte solvent mixts. have large capacity and long charge/discharge cycle life.

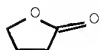
IT 96-48-0, γ-Butyrolactone 109-99-9,  
 Tetrahydrofuran, uses and miscellaneous 126-33-0,  
 Sulfolane 534-22-5, 2-Methylfuran

RL: USES (Uses)

(electrolyte solvent containing ethylene carbonate and  
 methyltetrahydrofuran and, for lithium  
 batteries)

RN 96-48-0 HCAPLUS

CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



RN 109-99-9 HCAPLUS

CN Furan, tetrahydro- (CA INDEX NAME)



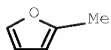
RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)

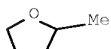


RN 534-22-5 HCAPLUS

CN Furan, 2-methyl- (CA INDEX NAME)



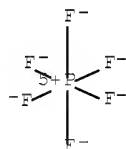
IT 96-47-9, 2-Methyltetrahydrofuran  
 RL: USES (Uses)  
 (electrolyte solvent containing, esters and ethers in, for  
 lithium batteries)  
 RN 96-47-9 HCAPLUS  
 CN Furan, tetrahydro-2-methyl- (CA INDEX NAME)



IT 14283-07-9 21324-40-3  
 RL: USES (Uses)  
 (electrolyte, solvent mixts. for, for secondary  
 batteries)  
 RN 14283-07-9 HCAPLUS  
 CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



RN 21324-40-3 HCAPLUS  
 CN Phosphate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



IC ICM H01M010-40  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
 Technology)  
 ST lithium battery electrolyte solvent  
 mixt; ethylene carbonate electrolyte solvent battery;  
 methyltetrahydrofuran electrolyte solvent  
 lithium battery; ester electrolyte solvent

## 10/658,272-266144-EIC 1700 SEARCH

battery; ether electrolyte solvent battery

IT Esters, uses and miscellaneous  
Ethers, uses and miscellaneous  
RL: USES (Uses)  
(electrolyte solvent containing ethylene carbonate and methyltetrahydrofuran and, for lithium batteries)

IT Batteries, secondary  
(lithium-manganese dioxide, nonaq. electrolytes for)

IT 36-48-0,  $\gamma$ -Butyrolactone 108-32-7, Propylene carbonate 109-99-9, Tetrahydrofuran, uses and miscellaneous 110-71-4, 1,2-Dimethoxyethane 126-33-0, Sulfolane 584-22-5, 2-Methylfuran 616-38-6, Dimethyl carbonate 629-14-1 646-06-0, 1,3-Dioxolane 4437-85-8, Butylene carbonate 17081-21-9, 1,3-Dimethoxypropane  
RL: USES (Uses)  
(electrolyte solvent containing ethylene carbonate and methyltetrahydrofuran and, for lithium batteries)

IT 96-47-9, 2-Methyltetrahydrofuran 96-49-1, Ethylene carbonate  
RL: USES (Uses)  
(electrolyte solvent containing, esters and ethers in, for lithium batteries)

IT 14283-07-9 21324-40-3  
RL: USES (Uses)  
(electrolyte, solvent mixts. for, for secondary batteries)

L132 ANSWER 23 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN  
ACCESSION NUMBER: 1990:555874 HCAPLUS Full-text  
DOCUMENT NUMBER: 113:155874  
ORIGINAL REFERENCE NO.: 113:26457a,26460a  
TITLE: Preparation of ion-conductive solid electrolyte and its use in lithium batteries  
INVENTOR(S): Takahashi, Toru; Shimizu, Ryuichi; Suehiro, Tsutomu; Ashitaka, Hidetomo  
PATENT ASSIGNEE(S): Japan  
SOURCE: U.S., 7 pp. Cont.-in-part of U.S. Ser. No. 106,641.  
CODEN: USXXAM  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 5  
PATENT INFORMATION:

PATENT NO. -----	KIND ----	DATE -----	APPLICATION NO. -----	DATE
US 4908283	A	19900313	US 1989-342122	1989 0424
JP 63094501	A	19880425	JP 1986-239041	1986 1009
JP 03073081	B	19911120		
JP 63094563	A	19880425	JP 1986-239042	1986 1009
JP 63135477	A	19880607	JP 1986-281148	1986 1126

## 10/658,272-266144-EIC 1700 SEARCH

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JP 06096699	B	19941130		
JP 63181259	A	19880726	JP 1987-12273	1987 0123

<--

JP 05063905	B	19930913	JP 1986-239041	A
PRIORITY APPLN. INFO.:				1986 1009

<--

			JP 1986-239042	A
				1986 1009

<--

			JP 1986-281148	A
				1986 1126

<--

			JP 1987-12273	A
				1987 0123

<--

			US 1987-106641	A2
				1987 1008

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ED Entered STN: 27 Oct 1990

AB The electrolyte is prepared by curing a composition of an acryloyl-terminated polyoxyalkylene of mol. weight 200-3000, 0.05-50 mol% inorg. salt, and 200 weight% organic solvent by irradiation with active rays (high-pressure Hg lamp). The acryloyl-terminated polyoxyalkene comprises CH(R1)C(R2)CO2 and (CH2CHR2O)n, where R and R2 are H or C1-6 alkyl, R1 is H or an aromatic group, and n is an integer of 1-30. The salt is a Li, Na, K, Cs, Ag, Cu, or Mg salt and the solvent is selected from propylene carbonate, butyrolactone, ethylene carbonate, THF, MeCN, DME, DMSO, dioxolane, and sulfolane. A solid-electrolyte battery uses a Li or Li alloy anode and a cathode of a cured product of a cathode active material (MnO2) and the electrolyte. The ion conductivities of the LiClO4-containing invention electrolyte films at .apprx.20° were 5.9 + 10-5 to 1.1 + 10-7 S/cm.

IT 96-48-0,  $\gamma$ -Butyrolactone

RL: USES (Uses)

(electrolytes containing acryloyl-terminated polyoxyalkylene and inorg. compds. and, for batteries)

RN 96-48-0 HCAPLUS

CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



IT 109-99-9, THF, uses and miscellaneous 126-33-0, Sulfolane

RL: TEM (Technical or engineered material use); USES (Uses)

(electrolytes containing acryloyl-terminated polyoxyalkylene and inorg. compds. and, for batteries)

RN 109-99-9 HCAPLUS

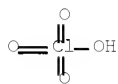
CN Furan, tetrahydro- (CA INDEX NAME)



RN 126-33-0 HCAPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IT 7791-03-9  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (electrolytes containing acryloyl-terminated polyoxyalkylene and  
 organic solvents and, for batteries)  
 RN 7791-03-9 HCAPLUS  
 CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



IC H01M006-18; H01M010-26  
 INCL 429192000  
 CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
 Technology)  
 Section cross-reference(s): 35, 76  
 ST polyoxyalkylene acrylate battery electrolyte; lithium  
 manganese dioxide battery electrolyte; manganese dioxide  
 polyoxyalkylene acrylate cathode; elec cond  
 polyoxyalkylene acrylate electrolyte; lithium perchlorate  
 polyoxyalkylene acrylate electrolyte  
 IT Polyoxyalkylenes, compounds  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (acrylates, polymers, electrolytes containing organic  
 solvents and lithium salts and, for  
 batteries)  
 IT Batteries, primary  
 Batteries, secondary  
 (lithium-manganese dioxide, electrolytes  
 containing acryloyl-terminated polyoxyalkylene and lithium  
 salt and organic solvent for)  
 IT Cathodes  
 (battery, manganese dioxide, containing acryloyl-terminated  
 polyoxyalkylene and lithium salt and  
 organic solvents)  
 IT Electric conductivity and conduction  
 (ionic, of electrolytes contg acryloyl-terminated  
 polyoxyalkylene and lithium salts and  
 organic solvents, for batteries)  
 IT 1313-13-9, Manganese dioxide, uses and miscellaneous  
 RL: DEV (Device component use); USES (Uses)  
 (cathodes, containing acryloyl-terminated  
 polyoxyalkylene-lithium salt  
 electrolytes, for batteries)  
 IT 67-68-5, DMSO, uses and miscellaneous 75-05-8, Acetonitrile,

## 10/658,272-266144-EIC 1700 SEARCH

uses and miscellaneous 96-48-0,  $\gamma$ -Butyrolactone

96-49-1, Ethylene carbonate 108-32-7, Propylene carbonate

RL: USES (Uses)

(electrolytes containing acryloyl-terminated polyoxyalkylene and inorg. compds. and, for batteries)

IT 109-99-9, THF, uses and miscellaneous 110-71-4

126-33-0, Sulfolane 646-06-0, Dioxolane

RL: TEM (Technical or engineered material use); USES (Uses)

(electrolytes containing acryloyl-terminated polyoxyalkylene and inorg. compds. and, for batteries)

IT 7791-03-9

RL: TEM (Technical or engineered material use); USES (Uses)

(electrolytes containing acryloyl-terminated polyoxyalkylene and organic solvents and, for batteries)

IT 7439-93-2D, Lithium, acryloyl-terminated polyoxyalkylene complexes

7439-95-4D, Magnesium, acryloyl-terminated polyoxyalkylene

complexes 7440-09-7D, Potassium, acryloyl-terminated

polyoxyalkylene complexes 7440-22-4D, Silver,

acryloyl-terminated polyoxyalkylene complexes 7440-23-5D,

Sodium, acryloyl-terminated polyoxyalkylene complexes

7440-46-2D, Cesium, acryloyl-terminated polyoxyalkylene complexes

7440-50-8D, Copper, acryloyl-terminated polyoxyalkylene complexes

129845-23-4D, lithium complexes

RL: TEM (Technical or engineered material use); USES (Uses)

(electrolytes, containing organic solvents, for batteries)

L132 ANSWER 24 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1988:64511 HCAPLUS Full-text

DOCUMENT NUMBER: 108:64511

ORIGINAL REFERENCE NO.: 108:10593a,10596a

TITLE: Oxidation potentials of electrolyte solutions for lithium cells

AUTHOR(S): Ossola, F.; Pistoia, G.; Seeber, R.; Ugo, P.

CORPORATE SOURCE: Ist. Chim. Tecnol. Radioelem., C. N. R., Padova, Italy

SOURCE: Electrochimica Acta (1988), 33(1), 47-50

CODEN: ELCAAV; ISSN: 0013-4686

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 20 Feb 1988

AB The oxidation potentials, Eox of several solns. of interest for nonaq. Li cells were measured by linear sweep voltammetric expts. A correlation is found between Eox and the basicity of the solvents, expressed by their donor nos. (DN). Esters and sulfones have higher resistance to oxidation than ethers, which possess the highest DN values. All solns. had Eox > 4 V vs. Li/Li+. However, some reactivity between pos. electrodes and solns. was observed below this potential.

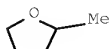
IT 96-47-9, 2-Methyltetrahydrofuran

RL: PRP (Properties)

(oxidation potential of electrolyte solns. of THF and, in lithium cells)

RN 96-47-9 HCAPLUS

CN Furan, tetrahydro-2-methyl- (CA INDEX NAME)



IT 126-33-0, Sulfolane

RL: PRP (Properties)

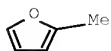
(oxidation potential of electrolyte solns. of benzene and, in lithium cells)

## 10/658,272-266144-EIC 1700 SEARCH

RN 126-33-0 HCAPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



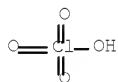
IT 534-22-5, 2-Methylfuran  
 RL: PRP (Properties)  
 (oxidation potential of electrolyte solns. of  
 methyltetrahydrofuran and THF and, in lithium cells)  
 RN 534-22-5 HCAPLUS  
 CN Furan, 2-methyl- (CA INDEX NAME)



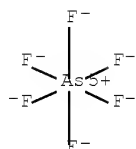
IT 109-99-9, properties  
 RL: PRP (Properties)  
 (oxidation potential of electrolyte solns. of methyltetrahydrofuran  
 and, in lithium cells)  
 RN 109-99-9 HCAPLUS  
 CN Furan, tetrahydro- (CA INDEX NAME)



IT 7791-03-9, Lithium perchlorate 29935-35-1  
 RL: PRP (Properties)  
 (oxidation potentials of electrolyte solns. for  
 lithium cells containing)  
 RN 7791-03-9 HCAPLUS  
 CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



RN 29935-35-1 HCAPLUS  
 CN Arsenate(1-), hexafluoro-, lithium (1:1) (CA INDEX NAME)



● Li<sup>+</sup>

CC 72-2 (Electrochemistry)  
 Section cross-reference(s): 23, 27, 52, 78  
 ST lithium cell electrolyte oxidn potential  
 IT Batteries, primary  
 (lithium, oxidation of electrolyte solns. in)  
 IT Nucleophilicity  
 (oxidation potential of organic solvents in  
 relation to)  
 IT Cathodes  
 (teflonized acetylene black, in lithium  
 batteries)  
 IT 96-47-9, 2-Methyltetrahydrofuran  
 RL: PRP (Properties)  
 (oxidation potential of electrolyte solns. of THF and, in lithium  
 cells)  
 IT 126-33-0, Sulfolane  
 RL: PRP (Properties)  
 (oxidation potential of electrolyte solns. of benzene and, in  
 lithium cells)  
 IT 534-22-5, 2-Methylfuran  
 RL: PRP (Properties)  
 (oxidation potential of electrolyte solns. of  
 methyltetrahydrofuran and THF and, in lithium cells)  
 IT 109-99-9, properties  
 RL: PRP (Properties)  
 (oxidation potential of electrolyte solns. of methyltetrahydrofuran  
 and, in lithium cells)  
 IT 7791-03-9, Lithium perchlorate 29935-35-1  
 RL: PRP (Properties)  
 (oxidation potentials of electrolyte solns. for  
 lithium cells containing)

L132 ANSWER 25 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1987:537569 HCAPLUS Full-text

DOCUMENT NUMBER: 107:137569

ORIGINAL REFERENCE NO.: 107:22179a,22182a

TITLE: Electrochemical and structural characteristics  
 of niobium(V) oxide in a rechargeable  
 lithium battery

AUTHOR(S): Kumagai, N.; Ishiyama, I.; Tanno, K.

CORPORATE SOURCE: Fac. Eng., Iwate Univ., Morioka, 020, Japan

SOURCE: Journal of Power Sources (1987),  
 20(3-4), 193-8

CODEN: JPSODZ; ISSN: 0378-7753

DOCUMENT TYPE: Journal

LANGUAGE: English

ED Entered STN: 17 Oct 1987

AB The discharge behavior of Nb2O5 in various electrolytes is unaffected by the choice of solvent, but is strongly dependent on the crystal radius of the solute cation species. Thermodyn. and structural studies show that this is due to the insertion of unsolvated Li<sup>+</sup> into the crystal lattice. The graphite content of the Nb2O5 electrode has a marked influence on the cycling behavior on account of the decrease in the oxide conductivity with discharge. Furthermore, the chemical diffusion coefficient of Li<sup>+</sup> ions in Nb2O5 is



# 10/658,272-266144-EIC 1700 SEARCH

.apprx.10-10 cm<sup>2</sup>/s, which is 1 order of magnitude smaller than that in V205 with a layered structure.

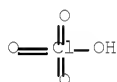
IT 96-48-0, Butyrolactone 126-33-0, Sulfolane  
 RL: USES (Uses)  
 (electrolytes, containing lithium perchlorate,  
 niobium pentoxide cathode discharge in, in  
 lithium batteries)  
 RN 96-48-0 HCAPLUS  
 CN 2(3H)-Furanone, dihydro- (CA INDEX NAME)



RN 126-33-0 HCAPLUS  
 CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



IT 7791-03-9, Lithium perchlorate  
 RL: USES (Uses)  
 (electrolytes, in organic solvents,  
 niobium pentoxide cathode discharge in, in  
 lithium batteries)  
 RN 7791-03-9 HCAPLUS  
 CN Perchloric acid, lithium salt (1:1) (CA INDEX NAME)



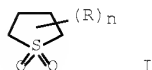
CC 52-2 (Electrochemical, Radiational, and Thermal Energy  
 Technology)  
 Section cross-reference(s): 72  
 ST lithium battery niobium pentoxide  
 IT Diffusion  
 (of lithium ion, in niobium pentoxide and  
 vanadium pentoxide cathodes, of lithium  
 batteries)  
 IT Cathodes  
 (battery, niobium pentoxide, with crystal structure of  
 three-dimensional packing, electrochem. and structural  
 characteristics of)  
 IT 1314-62-1, Vanadium pentoxide, uses and miscellaneous  
 RL: USES (Uses)  
 (cathodes, lithium diffusion in, discharge capacity  
 in relation to)  
 IT 1313-96-8, Niobium pentoxide  
 RL: USES (Uses)

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- (cathodes, with crystal structure of three-dimensional packing, electrochem. and structural characteristics of, for lithium batteries)
- IT 7439-93-2, Lithium, properties  
RL: PEP (Physical, engineering or chemical process); PROC (Process)  
(diffusion of, in niobium pentoxide and vanadium pentoxide cathodes, of lithium batteries)
- IT 67-68-5, DMSO, uses and miscellaneous 96-48-0, Butyrolactone 108-32-7, Propylene carbonate 126-33-0, Sulfolane  
RL: USES (Uses)  
(electrolytes, containing lithium perchlorate, niobium pentoxide cathode discharge in, in lithium batteries)
- IT 7791-03-9, Lithium perchlorate  
RL: USES (Uses)  
(electrolytes, in organic solvents, niobium pentoxide cathode discharge in, in lithium batteries)
- IT 7782-42-5, Graphite, uses and miscellaneous  
RL: USES (Uses)  
(niobium pentoxide cathodes containing, lithium batteries, cycling performance in relation to)

L132 ANSWER 26 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN  
ACCESSION NUMBER: 1984:539754 HCAPLUS Full-text  
DOCUMENT NUMBER: 101:139754  
ORIGINAL REFERENCE NO.: 101:21093a,21096a  
TITLE: Polymer-electrode battery  
PATENT ASSIGNEE(S): Showa Denko K. K., Japan; Hitachi, Ltd.  
SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.  
CODEN: JKXXAF  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO. -----	KIND ----	DATE -----	APPLICATION NO. -----	DATE
JP 59042784	A	19840309	JP 1982-152698	1982 0903
			<--	
PRIORITY APPLN. INFO.:			JP 1982-152698	1982 0903
			<--	
ED Entered STN: 13 Oct 1984				
GI				



AB In a battery having an anode and cathode of a polymer with double bonds, I (R = H, C1-15 alkyl, or C6-15 aryl; and n = 0-4) is used as an organic solvent for an electrolyte. Alternatively, a conductive polymer from the doped polymer may be used as the anode and cathode. Thus, 3-methyltetrahydrothiophene 1,1-dioxide [872-93-S] is used as a

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solvent for LiBF<sub>4</sub> of a secondary battery having a polyacetylene anode and cathode .  
The battery had a high energy d. and charge-discharge property.

IT 14283-07-9

RL: PRP (Properties)

(electrolyte, in methyltetrahydrothiophene dioxide for  
secondary battery with polyacetylene  
electrodes)

RN 14283-07-9 HCAPLUS

CN Borate(1-), tetrafluoro-, lithium (1:1) (CA INDEX NAME)



● Li<sup>+</sup>

IT 126-33-00, derivs.

RL: PRP (Properties)

(solvent, for battery with polymer electrodes)

RN 126-33-0 HCAPLUS

CN Thiophene, tetrahydro-, 1,1-dioxide (CA INDEX NAME)



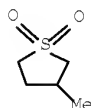
IT 872-93-5

RL: PRP (Properties)

(solvent, for lithium tetrahydroborate  
electrolyte for secondary battery  
with polyacetylene electrodes)

RN 872-93-5 HCAPLUS

CN Thiophene, tetrahydro-3-methyl-, 1,1-dioxide (CA INDEX NAME)



IC H01M010-40

ICA H01M004-36

CC 72-3 (Electrochemistry)

ST hydrothiophene oxide solvent secondary battery

IT Batteries, secondary

(nonaq., with polymer electrodes and tetrahydrothiophene  
dioxide derivs. as solvent)

IT 25067-58-7

RL: PRP (Properties)

(electrodes, in battery with Me tetrahydrothiophene dioxide  
solvent and lithium fluoroborate electrolyte  
)

IT 25190-62-9 51325-05-4

RL: PRP (Properties)  
 (electrodes, in secondary battery with  
 solvent from tetrahydrothiophene dioxide derivs.)

IT 14285-87-9  
 RL: PRP (Properties)  
 (electrolyte, in methyltetrahydrothiophene dioxide for  
 secondary battery with polyacetylene  
 electrodes)

IT 126-33-00, derivs.  
 RL: PRP (Properties)  
 (solvent, for battery with polymer electrodes)

IT 872-93-5  
 RL: PRP (Properties)  
 (solvent, for lithium tetrahydroborate  
 electrolyte for secondary battery  
 with polyacetylene electrodes)

L132 ANSWER 27 OF 27 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 1983:460825 HCAPLUS Full-text  
 DOCUMENT NUMBER: 99:60825  
 ORIGINAL REFERENCE NO.: 99:9361a,9364a  
 TITLE: Electrochemistry of a nonaqueous  
 lithium/sulfur cell  
 AUTHOR(S): Yamin, H.; Peled, E.  
 CORPORATE SOURCE: Dep. Chem., Tel-Aviv Univ., Tel Aviv Jaffa,  
 69978, Israel  
 SOURCE: Journal of Power Sources (1983),  
 9(3-4), 281-7  
 CODEN: JPSODZ; ISSN: 0378-7753  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 ED Entered STN: 12 May 1984

AB The development and the electrochem. of laboratory prototype Li/S button cells is  
 described. The cell consists of a Li anode, a porous catalytic current collector which  
 is loaded with S, and an organic solvent containing Li polysulfide. The case of the  
 cell was made from stainless steel and sealing was accomplished by the use of a  
 combination of organic elastomer and cement (with no crimping). After 3 wk storage at  
 60°, the button cells lost only .apprx.1 mg of weight. The Li polysulfide reacts with  
 the Li anode to form a passivating layer which acts as a solid electrolyte interphase.  
 The electromotive force of the cells changes from 2.38 to 2.15 V depending on the  
 composition of the solns. Cells exhibit flat discharge curves at low drains. The  
 energy d. of the cells is 730 W-h/kg or 900 W-h/l at room temperature and 950 W-h/kg or  
 1200 W-h/L at 60° (calculated on the basis of all cell components, excluding the case).  
 Storage and discharge tests at 60° show a capacity loss of 2-5% per mo depending on  
 solution composition. This indicates a shelf life of at least 10 yr at room temperature

IT 109-99-9, uses and miscellaneous  
 RL: USES (Uses)  
 (lithium-sulfur battery with  
 electrolyte from lithium perchlorate saturated  
 with polysulfide dissolved in toluene)

RN 109-99-9 HCAPLUS  
 CN Furan, tetrahydro- (CA INDEX NAME)



CC 72-3 (Electrochemistry)  
 Section cross-reference(s): S2  
 ST lithium sulfur nonaq battery  
 IT Batteries, primary  
 (button-type nonaq., lithium-sulfur)  
 IT 7704-34-9, uses and miscellaneous

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RL: USES (Uses)  
    (cathode, in nonaq. button-type battery  
    with lithium)

IT 109-99-9, uses and miscellaneous

RL: USES (Uses)  
    (lithium-sulfur battery with  
    electrolyte from lithium perchlorate saturated  
    with polysulfide dissolved in toluene)

IT 7791-03-9

RL: PRP (Properties)  
    (lithium-sulfur battery with toluene-THF  
    containing polysulfide and)

IT 74432-42-1

RL: PRP (Properties)  
    (lithium-sulfur button-type battery with organic  
    solvent containing)

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## FULL SEARCH HISTORY

=> d his nofile

(FILE 'HOME' ENTERED AT 09:24:53 ON 25 JUL 2008)

FILE 'HCAPLUS' ENTERED AT 09:25:13 ON 25 JUL 2008

E US20040185347/PN

L1 1 SEA ABB=ON PLU=ON US20040185347/PN  
D ALL  
SEL RN

FILE 'REGISTRY' ENTERED AT 09:26:11 ON 25 JUL 2008

L2 54 SEA ABB=ON PLU=ON (463-79-6/BI OR 10377-51-2/BI OR  
105-58-8/BI OR 108-32-7/BI OR 108-88-3/BI OR 117-80-6/B  
I OR 1192-62-7/BI OR 1193-79-9/BI OR 126-33-0/BI OR  
127-63-9/BI OR 131651-65-5/BI OR 13243-65-7/BI OR  
1330-20-7/BI OR 14024-11-4/BI OR 14283-07-9/BI OR  
162684-16-4/BI OR 16851-82-4/BI OR 18424-17-4/BI OR  
1889-59-4/BI OR 21324-40-3/BI OR 271-89-6/BI OR  
27359-10-0/BI OR 28122-14-7/BI OR 28452-93-9/BI OR  
29935-35-1/BI OR 33454-82-9/BI OR 35363-40-7/BI OR  
3680-02-2/BI OR 37220-89-6/BI OR 39300-70-4/BI OR  
4265-27-4/BI OR 4437-85-8/BI OR 462-06-6/BI OR  
524-42-5/BI OR 5535-43-3/BI OR 5535-48-8/BI OR  
56525-42-9/BI OR 616-38-6/BI OR 620-32-6/BI OR  
623-53-0/BI OR 623-96-1/BI OR 625-86-5/BI OR 67-71-0/BI  
OR 693-98-1/BI OR 71-43-2/BI OR 7439-93-2/BI OR  
7447-41-8/BI OR 7474-83-1/BI OR 77-77-0/BI OR 7791-03-9  
/BI OR 80-05-7/BI OR 90076-65-6/BI OR 95-15-8/BI OR  
96-49-1/BI)  
D SCAN

FILE 'STNGUIDE' ENTERED AT 09:27:20 ON 25 JUL 2008

FILE 'LREGISTRY' ENTERED AT 09:31:14 ON 25 JUL 2008

L3 STR

FILE 'REGISTRY' ENTERED AT 09:34:55 ON 25 JUL 2008

L4 50 SEA SSS SAM L3

FILE 'LREGISTRY' ENTERED AT 09:35:48 ON 25 JUL 2008

L5 STR L3

FILE 'REGISTRY' ENTERED AT 09:37:10 ON 25 JUL 2008

L6 50 SEA SSS SAM L5

FILE 'STNGUIDE' ENTERED AT 09:37:43 ON 25 JUL 2008

FILE 'REGISTRY' ENTERED AT 09:41:24 ON 25 JUL 2008

L7 SCR 1838  
L8 SCR 2043  
L9 50 SEA SSS SAM L3 AND L7 NOT L8  
L10 SCR 2043 OR 1841  
L11 50 SEA SSS SAM L3 AND L7 NOT L10  
L12 SCR 2043 OR 1841 OR 1918  
L13 50 SEA SSS SAM L3 AND L7 NOT L12  
L14 SCR 2043 OR 1840 OR 1918  
L15 50 SEA SSS SAM L3 AND L7 NOT L14  
L16 50 SEA SSS SAM L5 AND L7 NOT L14  
L17 SCR 2043 OR 1840 OR 1918 OR 1950  
L18 50 SEA SSS SAM L5 AND L7 NOT L17  
L19 SCR 2043 OR 1840 OR 1918 OR 1948  
L20 SCR 2043 OR 1840 OR 1918 OR 1948  
L21 50 SEA SSS SAM L5 AND L7 NOT L20  
L22 28 SEA ABB=ON PLU=ON L2 AND 1-2/NR

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D SCAN

FILE 'STNGUIDE' ENTERED AT 09:50:42 ON 25 JUL 2008

FILE 'REGISTRY' ENTERED AT 09:52:57 ON 25 JUL 2008

L23 0 SEA ABB=ON PLU=ON L22 AND 3-9/N  
 L24 0 SEA ABB=ON PLU=ON L22 AND 2-9/S  
 L25 SCR 2043 OR 1840 OR 1918 OR 1948 OR 1994  
 L26 50 SEA SSS SAM L3 AND L7 NOT L25  
 L27 SCR 2043 OR 1840 OR 1918 OR 1948 OR 1994 OR 2016 OR 202  
 L28 50 SEA SSS SAM L3 AND L7 NOT L27  
 L29 SCR 2043 OR 1840 OR 1918 OR 1947 OR 1994 OR 2016 OR 202  
 L30 50 SEA SSS SAM L3 AND L7 NOT L29  
 L31 50 SEA SSS SAM L5 AND L7 NOT L29  
 L32 STR L3  
 L33 50 SEA SSS SAM L32 AND L7 NOT L29

FILE 'LREGISTRY' ENTERED AT 10:11:38 ON 25 JUL 2008

L34 STR L32

FILE 'REGISTRY' ENTERED AT 10:18:07 ON 25 JUL 2008

L35 50 SEA SSS SAM L34  
 L36 50 SEA SSS SAM L34 AND L7 NOT L29  
 L37 3 SEA ABB=ON PLU=ON L22 AND 3-9/O  
 D SCAN  
 D QUE L29  
 L38 SCR 2043 OR 1840 OR 1918 OR 1947 OR 1994 OR 2016 OR 202  
 L39 50 SEA SSS SAM L34 AND L7 NOT L38  
 L40 278393 SEA SSS FUL L34 AND L7 NOT L38  
 D SAV  
 L41 10 SEA ABB=ON PLU=ON L2 AND L40  
 SAV L40 WEI272REG/A

FILE 'LREGISTRY' ENTERED AT 10:31:09 ON 25 JUL 2008

L42 STR

FILE 'REGISTRY' ENTERED AT 10:40:57 ON 25 JUL 2008

L43 50 SEA SSS SAM L42  
 L44 SCR 1839  
 L45 SCR 1840 OR 2043 OR 1918  
 L46 50 SEA SSS SAM L42 AND L44 NOT L45  
 L47 11 SEA ABB=ON PLU=ON L2 AND 2/NR  
 D SCAN  
 D QUE STAT L46  
 L48 3523 SEA SSS FUL L42 AND L44 NOT L45  
 SAV TEMP L48 WEI272REGA/A

FILE 'STNGUIDE' ENTERED AT 10:47:57 ON 25 JUL 2008

FILE 'LREGISTRY' ENTERED AT 10:48:57 ON 25 JUL 2008

L49 STR

FILE 'REGISTRY' ENTERED AT 10:51:47 ON 25 JUL 2008

L50 50 SEA SSS SAM L49

FILE 'LREGISTRY' ENTERED AT 10:52:29 ON 25 JUL 2008

L51 STR L49

FILE 'REGISTRY' ENTERED AT 10:58:46 ON 25 JUL 2008

L52 33 SEA SSS SAM L51  
 L53 12 SEA ABB=ON PLU=ON L2 AND ?SULFONE?/CNS  
 D SCAN  
 L54 16 SEA ABB=ON PLU=ON L2 AND 1-9/S  
 L55 4 SEA ABB=ON PLU=ON L54 NOT L53  
 D SCAN  
 L56 SCR 1840 OR 2043  
 L57 SCR 2005 AND 2021

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L58 50 SEA SSS SAM L51 AND L57 NOT L56  
 D QUE STAT  
 L59 SCR 1840 OR 2043 OR 2023 OR 1947 OR 1993 OR 2016 OR 202  
 L60 50 SEA SSS SAM L51 AND L57 NOT L59  
 L61 45053 SEA SSS FUL L51 AND L57 NOT L59  
 SAV L61 WEI272REGB/A

FILE 'HCAPLUS' ENTERED AT 11:14:36 ON 25 JUL 2008  
 D SCAN L1

FILE 'REGISTRY' ENTERED AT 11:14:36 ON 25 JUL 2008  
 L62 1 SEA ABB=ON PLU=ON 4265-27-4/RN  
 D SCAN  
 L63 1 SEA ABB=ON PLU=ON 80-05-7/RN  
 D SCAN  
 L64 1 SEA ABB=ON PLU=ON 95-15-8/RN  
 D SCAN

FILE 'HCAPLUS' ENTERED AT 11:19:23 ON 25 JUL 2008  
 D SCAN L1

FILE 'REGISTRY' ENTERED AT 11:19:24 ON 25 JUL 2008  
 L65 1 SEA ABB=ON PLU=ON L2 AND ?PYRROL?/CNS  
 D SCAN  
 D CN  
 L66 1 SEA ABB=ON PLU=ON 271-89-6/RN  
 D SCAN  
 L67 1 SEA ABB=ON PLU=ON 693-98-1/RN

FILE 'HCAPLUS' ENTERED AT 11:27:02 ON 25 JUL 2008  
 D SCAN L1

E "SECONDARY BATTERIES"/CT  
 L68 180074 SEA ABB=ON PLU=ON "SECONDARY BATTERIES"+MAX/CT  
 L69 85408 SEA ABB=ON PLU=ON BATTER?(2A)(SECONDAR? OR LITHIUM)  
 L70 199825 SEA ABB=ON PLU=ON L68 OR L69  
 E LITHIUM/CT 25  
 L71 52300 SEA ABB=ON PLU=ON LITHIUM(2A)(SALT OR HALIDE OR  
 ELECTROLYTE OR CATION OR ION)

FILE 'ZCAPLUS' ENTERED AT 11:36:16 ON 25 JUL 2008  
 L72 QUE ABB=ON PLU=ON ELECTROD?(2A)POSITIVE OR CATHOD?

FILE 'HCAPLUS' ENTERED AT 11:38:18 ON 25 JUL 2008  
 L73 QUE ABB=ON PLU=ON SOLVENT?(2A)(ORGANIC OR NONAQUEOUS  
 OR NON(W)AQUEOUS)  
 D QUE STAT L47  
 D QUE STAT L48

FILE 'REGISTRY' ENTERED AT 11:41:12 ON 25 JUL 2008  
 D QUE STAT L40

L74 90575 SEA ABB=ON PLU=ON L40 AND 1/NR  
 L75 187818 SEA ABB=ON PLU=ON L40 NOT L74  
 L76 186965 SEA ABB=ON PLU=ON L40 AND 2/NR  
 L77 155844 SEA ABB=ON PLU=ON L76 AND 1-99/N  
 L78 147343 SEA ABB=ON PLU=ON L76 AND 1-99/O  
 L79 119040 SEA ABB=ON PLU=ON L77 AND L78  
 L80 63851 SEA ABB=ON PLU=ON L76 AND 1-99/S  
 L81 37023 SEA ABB=ON PLU=ON L79 AND L80  
 L82 82017 SEA ABB=ON PLU=ON L79 NOT L81  
 L83 41097 SEA ABB=ON PLU=ON L76 NOT (L80 OR L81 OR L82)

FILE 'HCAPLUS' ENTERED AT 11:54:09 ON 25 JUL 2008  
 L84 580816 SEA ABB=ON PLU=ON L74 OR L80 OR L81 OR L82 OR L83  
 L85 26032 SEA ABB=ON PLU=ON L48  
 L86 5406 SEA ABB=ON PLU=ON L70 AND (L84 OR L85)  
 L87 628 SEA ABB=ON PLU=ON L86 AND L71 AND L73  
 D QUE



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L88 257 SEA ABB=ON PLU=ON L87 AND L72

FILE 'REGISTRY' ENTERED AT 12:02:02 ON 25 JUL 2008

L89 15 SEA ABB=ON PLU=ON L2 AND 1-9/LI  
D SCAN

FILE 'STNGUIDE' ENTERED AT 12:02:38 ON 25 JUL 2008

FILE 'REGISTRY' ENTERED AT 12:04:40 ON 25 JUL 2008

FILE 'HCAPLUS' ENTERED AT 12:05:12 ON 25 JUL 2008

L90 QUE ABB=ON PLU=ON L89

L91 224 SEA ABB=ON PLU=ON L88 AND L90

FILE 'REGISTRY' ENTERED AT 12:05:34 ON 25 JUL 2008

FILE 'HCAPLUS' ENTERED AT 12:05:41 ON 25 JUL 2008  
D SCAN L1

FILE 'REGISTRY' ENTERED AT 12:05:41 ON 25 JUL 2008

L92 1 SEA ABB=ON PLU=ON 7439-93-2/RN  
D SCAN

L93 11 SEA ABB=ON PLU=ON L89 NOT (L92 OR TIS/CI)

L94 4 SEA ABB=ON PLU=ON L89 NOT L93  
D SCAN

FILE 'HCAPLUS' ENTERED AT 12:07:51 ON 25 JUL 2008

L95 QUE ABB=ON PLU=ON L93

L96 207 SEA ABB=ON PLU=ON L88 AND L95  
D SCAN L1  
D QUE STAT L61

L97 QUE ABB=ON PLU=ON L61

L98 29 SEA ABB=ON PLU=ON L96 AND L97  
E PASSIVATION/CT  
E E3+ALL

L99 288810 SEA ABB=ON PLU=ON PASSIVATION+MAX/CT

L100 0 SEA ABB=ON PLU=ON L96 AND L99

L101 1 SEA ABB=ON PLU=ON L99 AND L88

L102 54756 SEA ABB=ON PLU=ON PASSIVAT?

L103 QUE ABB=ON PLU=ON FILM? OR THINFILM? OR LAYER? OR  
OVERLAY? OR OVERLAID? OR LAMIN? OR LAMEL? OR MULTILAYER  
? OR SHEET? OR LEAF? OR FOIL? OR COAT? OR TOPCOAT? OR  
OVERCOAT? OR VENEER? OR SHEATH? OR COVER? OR ENVELOP?  
OR ENCASE? OR ENWRAP? OR OVERSPREAD? OR ENCAPSUL?

L104 18876 SEA ABB=ON PLU=ON L102(3A)L103

L105 299911 SEA ABB=ON PLU=ON L99 OR L104

L106 3 SEA ABB=ON PLU=ON L105 AND L88  
D SCAN

L107 10 SEA ABB=ON PLU=ON L105 AND L87

L108 10 SEA ABB=ON PLU=ON L101 OR L106 OR L107

L109 72122 SEA ABB=ON PLU=ON L63 OR BISPHENOL A

L110 46 SEA ABB=ON PLU=ON L65 AND PHENYLSULFONYL(A)PYRROLE

L111 2580 SEA ABB=ON PLU=ON L66 OR PHENYLSULFONYL(A)PYRROLE

L112 14059 SEA ABB=ON PLU=ON L67 OR BENZOFURAN

L113 16109 SEA ABB=ON PLU=ON L63 OR BUTYLBENZOFURAN

L114 869 SEA ABB=ON PLU=ON L65 OR THIANAPHTHENE

L115 15128 SEA ABB=ON PLU=ON L67 OR METHYLIMIDAZOLE OR METHYL(W)  
IMIDAZOLE

L116 4607 SEA ABB=ON PLU=ON L70 AND L73  
D QUE

L117 31 SEA ABB=ON PLU=ON L116 AND ((L109 OR L110 OR L111 OR  
L112 OR L113 OR L114 OR L115))

L118 10 SEA ABB=ON PLU=ON L117 AND L95

L119 11 SEA ABB=ON PLU=ON L117 AND L71

L120 1 SEA ABB=ON PLU=ON L118 AND L105  
D SCAN  
D QUE L98

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D QUE L98
L121      5 SEA ABB=ON  PLU=ON  L117 AND L97
L122      0 SEA ABB=ON  PLU=ON  L98 AND L105
L123      5 SEA ABB=ON  PLU=ON  L117 AND L97
L124     73077 SEA ABB=ON  PLU=ON  L109 OR L113 OR L114
L125      24 SEA ABB=ON  PLU=ON  L124 AND L116
L126      10 SEA ABB=ON  PLU=ON  L125 AND (L71 OR L72 OR L95 OR
L105)
D QUE L98
L127      51 SEA ABB=ON  PLU=ON  L98 OR L108 OR (L118 OR L119 OR
L120 OR L121 OR L122 OR L123) OR L126
L128     777304 SEA ABB=ON  PLU=ON  ELECTROCHEM?/SC,SX
L129      48 SEA ABB=ON  PLU=ON  L127 AND L128
L130      33 SEA ABB=ON  PLU=ON  L129 AND L72
L131      QUE ABB=ON  PLU=ON  PY<2004 OR PRY<2004 OR AY<2004 OR
MY<2004 OR REVIEW/DT
L132      27 SEA ABB=ON  PLU=ON  L130 AND L131
SAV TEMP L132 WEI272HCP/A
D QUE
D QUE STAT L132
D L132 1-27 IBIB ED ABS HITSTR HITIND

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